PB-227 578

SOLID WASTES: PROCEEDINGS OF A SYMPOSIUM AT LAWRENCE, KANSAS MARCH 2, 1966

Public Health Service
Kansas City, Missouri

1966

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SOLID WASTES

Proceedings of a Symposium
at Lawrence, Kansas
March 2, 1966

Public Health Service
Environmental Health
Reference Room

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U.S. DEPARTMENT OF HEALTH, EDUCATION , AND WELFARE
Public Health Service

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This publication of the symposium proceedings was prepared by the Office of Solid Wastes, Region VI, Public Health Service, U. S. Department of Health, Education, and Welfare, Kansas City, Missouri.

SYMPOSIUM ON SOLID WASTE

The purpose of this conference was to provide state and local officials and community leaders an opportunity to discuss a problem of major concern to the local communities and the state; to develop a working basis for cooperative efforts in solving it; and to obtain information regarding the assistance available from the Solid Waste Act and other Federal legislation.

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DEVELOPMENT OF SOUND SOLID WASTE PROGRAMS A MAJOR CHALLENGE TO FEDERAL, STATE AND LOCAL GOVERNMENTS

By Robert D. Bugher*

The improper handling of solid wastes is a source of many community nuisances such as smoke, odors and unsightliness. It also results in economic losses arising from fire and rodent damage, air and water pollution and depreciated property values.

Studies conducted by the American Public Works Association and the U. S. Public Health Service show that less than half of the cities and towns of over 2,500 population in this great country of ours employ approved sanitary methods of disposing of their solid wastes. The title of this paper suggests that this is a problem which should not be of concern to you and me as individuals (since we have many other things to worry about) but it is one that the federal, state and local governments should get their teeth into -- if you will pardon the expression.

It is hardly necessary for me to remind you that you are full-fledged citizens of each level of government and must end up footing the bill for all programs developed by your government. In addition, most of you are employees of a public agency or elected officials and therefore have a direct responsibility to study problems which effect the people you serve and use whatever authority and influence you may have to resolve such problems. Finally, it should be realized that each of us is, in part, responsible for the mounting quantities of wastes that are produced in our affluent society.

Therefore, I suggest that you stay with us throughout the day and learn about the magnitude and complexity of an age-old problem which has recently been recognized, at least at the federal level, as a basic deficiency which cannot be permitted to exist in the makeup of the great society. WHO is to do WHAT about the solid waste problem and HOW it will be done will be discussed at this symposium.

This particular problem is not unlike others which beset local units of government. The technological revolution has made it possible for tremendous progress to be made in all walks of life. The individual can often take advantage of these developments in a relatively short period of time and he expects his government to do the same thing. Unfortunately, he is not aware of all the restraints imposed on his local government. If he were, he would probably be amazed that it functions as well as it does.

Cities and towns are creatures of the state and have not always been given the authority and taxing power they need to respond to the

*Executive Director, American Public Works Association needs of the people. On the other hand, instances can be cited where cities have not used what authority they have as effectively as they should. The lack of opportunity for satisfying and adequately rewarding careers in the public service has made it difficult to attract the kind of professional manpower needed to enable local government to keep pace with the times. Diffusion of responsibility and authority has stiffled progress and has made it extremely difficult for persons with knowledge and ability to effectively serve their communities.

One by one, functions which traditionally have been regarded as the responsibility of local units of government are being reclassified as the "joint responsibility" of the federal, state and local government. This trend is admittedly disturbing to many of us, but it seems to be one of the most effective ways to deal with some of the problems currently facing urban communities.

The government (federal, state and local) presently collects sizeable sums of money from the individual taxpayer. Philosophically speaking, the municipal official seems to feel that a good many of these dollars that are going to the federal government are being spent on programs that, comparatively speaking, are of little value to the urban dweller. Since federal programs are available to help deal with almost every other conceivable problem, why not let the federal government help solve the solid waste problem. After all, he reasons, "it is our own money that is being spent and it will help make our community a better place in which to live." It is certainly difficult to refute this kind of reasoning when one considers all the inequities that exist as the net result of our tax structure and all the off-setting government programs that have been developed down through the years.

Therefore, it seems to me that local units of government should switch rather than fight federal and state intervention in this traditionally local field of activity. After all, who really cares who has to handle the dirty, rotten, stinking problem of getting rid of the garbage and rubbish produced in our urban communities?

Before proceeding any further, I should at least attempt to put this problem in proper perspective. This by itself is no easy task since we are living in a fast moving world and each of us is constantly aware of a myriad of problems which effect each of us in varying degrees. Therefore, what seems to warrant a high priority of time, effort and money in the eyes of one person may get a low priority rating in the eyes of others. This is undoubtedly one of the primary reasons why significant steps to solve solid waste problems have not been taken in the past. Each of us can certainly think of other problems - Viet Nam, for example - which are of more immediate concern to us as a Nation; yet we can also point to many other activities which are receiving a good deal of our time, effort and money which are of far less importance than our solid waste problem.

Historically speaking, we have always tried to solve this problem by exporting it beyond the range of sight and smell. Even today, many cities and towns dispose of their solid wastes outside their corporate limits. A 1962 survey by the Detroit Metropolitan Area Regional Planning Commission showed that 105 of the 164 communities in that area disposed of all or part of their wastes in neighboring communities. The concentration of population in urban areas coupled with the increasing demand for maintaining a high quality urban environment makes it necessary for us to find new solutions to the problem of disposing of solid wastes.

Surveys conducted by the U. S. Public Health Service and the American Public Works Association show that individual refuse production in this country amounts to about 4.5 lbs/capita/day or 1650/capital/year. It is assumed that the straight line trend from 1955 to date will continue at an annual increase of 25 lbs. per capita. This means that we are now producing about 160 million tons of refuse per year in the United States and that this will probably increase to about 260 million tons per year by 1980. About half of this increase is expected from the per capita increase in amount of refuse produced and the other half from the estimated increase in population. It should also be noted that refuse is becoming more bulky and less dense due to large increases in quantity of such materials as paper and plastics. The amounts of garbage and ashes are continuing a downward trend. However, the quantities of bulky wastes, abandoned vehicles and construction and demolition wastes are increasing and pose a serious problem in storage, collection and disposal.

The American people are spending nearly $3 billion per year to get rid of these wastes. The Environmental Pollution Panel of the President's Science Committee points out that a large fraction of raw consumer goods ends up as urban solid waste, but that significant amounts are salvaged and re-cycled back to industry. "Scrap iron and steel" it said, "are generated at a rate of about 12 to 15 million tons a year, of which about a third consists of derelict automobiles. The fraction recovered for use has declined substantially. The recovery of other scrap metals in 1963 included at least 974,000 tons of copper, 493,000 tons of lead and 268,000 tons of zinc."

"From 25 to 30 million tons of paper products are produced annually and about 10 million tons of waste paper was salvaged in 1964 and used to make new paper. In 1962 a total of 263,000 tons of reclaimed rubber was used in the United States representing about 15 per cent of all rubber used. In the same year about 10 per cent of the 8 billion pounds of plastic produced was recovered and reconverted."

We should also take note of the fact that agricultural wastes are becoming an increasingly serious problem as urban areas encroach upon rural land. Recent surveys conducted by the American Public

Works Association, which will be reported in the 1966 edition of its text book titled "Refuse Collection Practice" show that 44 per cent of approximately 1,000 cities reporting provide municipal refuse collection service; 35 per cent use refuse contractors or private haulers to provide this service and 21 per cent use a combination of municipal and contractor or private haulers - usually collecting refuse from residences with city crews and having a contractor or private hauler make the collections from commercial establishments. The advantages and disadvantages of each method are discussed in this text. Suffice it to say that it is possible to find good and bad examples of each method. Regardless of the method used the mayor and council of each and every city are responsible for seeing to it that an efficient, reliable, sanitary refuse collection and disposal system is available to serve the citizens of their community.

I previously indicated that the total annual refuse bill is in the neighborhood of 3 billion dollars. Broken down on an individual basis the cost amounts to approximately $1.50 per month for refuse collection service for a single family unit. In about 50 per cent of the cities, this cost is paid out of general tax revenues; 35 per cent of the cities make a special charge for this service and about 15 per cent use a combination of the two methods - usually financing residential service from general taxes and levying a special charge for collections from commercial establishments. Generally speaking, the large amount of labor and equipment involved makes collection costs range from 3 to 6 times greater than the cost of disposal.

Dr. J. E. McKee, Professor of Environmental Health Engineering of the California Institute of Technology, has made some interesting comparisons of the relative cost of collection and disposal of solid and liquid wastes in Los Angeles County. He finds that the solid waste problem is four times larger on a dry weight basis, slightly larger in total annual cost and over three times as large on the basis of annual operating costs. The estimated annual per capita cost for waste water (sewage) was $1.45 for operating costs plus $3.50 for amortization of capital costs, while the cost of refuse collection and disposal was only $0.85 for amortization of capital costs and $4.80 for operating costs.

Yet, in spite of these figures, far greater sums are spent on research in the liquid waste field and many more scientists and engineers are at work on waste-water problems. This then, points up one of the major weaknesses in the solid wastes field - the lack of an adequate research program.

The American Public Works Association became concerned about this problem some time ago and established a Research Foundation which provides the means and machinery to permit cities and other public agencies to join together to finance research projects in which they have a common interest. It has conducted several projects in this field such as a $60,000 study on the use of paper bags for handling household refuse and another costing some $100,000 which involves the development of a device to monitor particulate matter emitted from an incinerator stack. This latter project has been financed by over 20 public agencies including New York, Chicago, Philadelphia, St. Louis, Miami, Honolulu, Boston, Toronto, Milwaukee, Baltimore and Washington, D. C. to mention just a few. The U. S. Public Health Service has also shared in the cost of this particular project.

The Foundation has conducted surveys and conferences to identify promising research projects in this field and has helped initiate several important projects which are now being carried out at different universities throughout the country. Ideas for research that have been proposed include - studies to determine new uses for existing wastes, how to reduce refuse production and ways to improve salvaging procedures. Other studies have been proposed to determine the optimum size and best location for storage containers; the feasibility of using underground vacuum collection systems; how to increase the capacity of sanitary landfills, and the improvement of on-site reduction methods. Many new concepts will be practical only in completely new towns or subdivisions; but it is up to us to act now to serve the needs of future generations and devise ways to extend the benefits of these new developments to as many persons as possible during the process of building and rebuilding our urban communities.

The APWA was one of the first organizations in the country to urge the adoption of a federally supported research program in this field. Resolutions adopted by its membership in 1960 and again in 1963 helped draw attention to the need for the kind of research program authorized in the Solid Wastes Act of 1965. The funds made available under this new legislation will not only help finance cooperative research projects undertaken through the APWA Research Foundation, but will also support projects at many institutions throughout the country, including those initiated here at the University of Kansas.

One of the major problems which must first be overcome is to find or develop competent persons to do the research needed in this field. This cannot be done over night, but steps can and are being taken to develop graduate level courses in solid wastes so the necessary research talent can be developed as soon as possible. This leads up to another important problem which requires our immediate attention if we are to effectively solve the solid waste problem. This concerns the training and development of persons who are placed in charge of solid waste collection and disposal programs.

An analysis of the refuse collection and disposal function shows that it involves the use of relatively large numbers of employees and pieces of expensive equipment and the expenditure of substantial equipment and the expenditure of substantial sums of money. Therefore, it is obvious that sound management practices will pay big dividends. Yet, we find that very few persons who are responsible for this function have had any formal training in techniques of management and administration. This is not only a serious problem insofar as the solid waste field is concerned, but is unfortunately true in other branches of public works.

It is for this reason that the APWA established an Education Foundation some four years ago. Since that time it has developed a four pronged approach to deal with this important problem. First, it has entered into a contract with the University of Pittsburgh to develop a graduate level program leading to the degree of Master of Public Works. This program is oriented to the kinds of responsibilities which the public works official actually has and will, I believe, serve as a model for other institutions to follow who are really interested in helping to prepare persons for careers in the field of public works. Courses in solid waste collection and disposal will, of course, be included in this program.

The second phase of the Foundation's program involves the sponsorship of a series of public works management seminars. Three are being held this month at the University of California and at Syracuse and Wayne State Universities. A full quota of 30 public works officials from all parts of the country have been enrolled in each of these one-week seminars. The third approach taken by the APWA Education Foundation to help develop competent management talent in this field is the sponsorship of a public works engineer/management trainee program. Nearly one hundred public agencies have already agreed to participate in this important program which will give young college graduates an opportunity to learn what is involved in the management end of the business. We hope this will help attract talented young men to this field and feel sure that it is a step in the right direction.

The fourth and final phase of the APWA Education program deals with the development and sponsorship of short courses in various branches of specialization including that of solid waste collection and disposal. Courses in street maintenance, equipment management and inspection of public works construction have already been developed and have been offered at many colleges and universities in cooperation with the 51 chapters of this Association. The course in solid waste collection and disposal is now being developed with the assistance of the PHS Office of Solid Wastes and will be presented at convenient locations in all parts of the country during the next two years. The 1966 edition of "Refuse Collection Practice" and "Municipal Refuse Disposal" which will be off the press within the next 2 or 3 months will be used as the standard texts for this course. We shall, of course, look forward to receiving the full cooperation and support of the State Health Departments, the Universities, State Leagues of Municipalities and other interested groups in making this course available to persons responsible for the management of solid waste programs in cities and towns throughout the Nation. This, of course, will not solve the problem with which we are all concerned, but it, too, is a step in the right direction.

Indicative of the increasing attention being given to this field by the APWA is the formation of an Institute for Solid Wastes within the framework of this organization. The Institute came into being on January 1, 1966. Several hundred persons have already applied for membership in the Institute. Its purpose is to: promote the development and adoption of safe, sanitary and efficient methods of storing, collecting, utilizing or otherwise disposing of solid wastes discarded in urban communities by establishing and encouraging the adherence to sound technical requirements and regulatory measures and high professional standards for employees of public agencies who are responsible for street cleaning and refuse collection and disposal programs conducted by employees under their direct supervision or by private contractors and to represent such officials of the United States and Canada in the International Association of Public Cleansing.

What I have said thus far shows that we have not completely ignored the problems associated with the collection and disposal of solid wastes. On the other hand, organizations such as the APWA can only do so much to help solve this complex problem. The more difficult tasks of getting adequate financial support for a sound program, finding an acceptable site for a disposal facility and implementing the procedures described in the aforementioned publications - in other words, actually getting the job done, calls for a great deal of leadership by persons such as those of you assembled here today. Each of you in your own way can make an important contribution to the solution of this problem.

Prof. P. H. McGauhey, Director of the Sanitary Engineering Research Laboratory of the University of California pointed out, in a paper presented at the National Conference on Solid Waste Research at the University of Chicago in 1963, that the problem is compounded by the tendency to consider it as a matter for resolution at the technical level, subject to constraints imposed at the levels of planning, administration, politics, economics and sociology more to keep it from fouling up these areas than to contribute to a rational solution. He goes on to say: "The attitudes of citizens, engineers, public officials, private entrepreneurs, and other elements comprising the "public" contribute in an important manner to the creation of solid wastes problems and in inhibiting the development of logical systems for their solution. One needs only to consider the phenomenon of the "litterbug" to observe that there exists a "swinish" thread in the character of even the most civilized of our citizens. Perhaps it is an outgrowth of the long American tradition of waste -- i.e., of discarding or destroying any unwanted item in the cheapest possible manner. It might be said that any material becomes a "waste" whenever its owner or producer no longer considers it of sufficient value to retain. Any suggestion that he should thereupon invest more money in it, for the sake of disposal or any other financially unrewarding goal, is likely to be considered absurd, however inclined the citizen may be to object to polluted water, smog, rodents, odors, unsightly debris, and other conditions which result from his loss of interest in ownership.

"Ensnared in the public economic spirit of citizens, engineers and officials responsible for wastes management have tended to apologize for the fact that their systems cost anything whatsoever, often retreating from expedient to expedient on the basis of cost in dollars instead of leading the public to an understanding that solid wastes management is worth whatever it costs within the framework of honest engineering and sound public health practice; and that this cost is part of the price man must pay for the benefits of a modern urban-industrial-agricultural society."

Therefore, it seems to me that one of the major challenges confronting all of us is to face up to the fact that we are living in a rapidly changing world; that the increased concentration of population in urban areas creates serious problems in terms of maintaining a safe and healthy environment for our citizens; that our traditional concepts of preserving at all costs the freedom and independence of the individual must give way to restraints imposed by some authority - federal, state or local - if we are to survive in our modern-day urban society.

There is some reason to believe that federal and state action in this field may be limited, at least initially, to the disposal end of the business. From what little I know about the difficulty of finding acceptable disposal sites, I would think that most mayors and councils would be glad to get rid of this hot potato, provided, however, that they are assured that the disposal site will not end up in their own bailiwick. On the other hand, I hasten to add that the location of such facilities has a mighty important bearing on the cost of the overall operation. Therefore, the cost of transporting the refuse to the disposal site after it is collected must certainly be taken into account. So you can see that the two problems are closely inter-related and cannot be solved independent of each other.

In this regard, it should be pointed out that federal assistance programs (except in recent years, as for example in the war on poverty) have not dealt with operational problems at the local level of government. However, the satisfactory solution of this important problem, within the framework of existing urban communities, requires, as I previously pointed out, increased efficiency in the management of refuse collection and disposal operations. Therefore, we may be approaching an important milestone in the field of intergovernmental relations.

The uncontrolled incorporation of many small cities and towns during the past 50 to 60 years has mitigated against the development of county governments as effective instrumentalities for serving the needs of the people in smaller communities. By the same token, federal and state assistance programs have had the tendency to weaken even the larger cities and towns because they have relieved them of the responsibility for developing well-trained professional staffs having the capability of dealing with the mounting problems of a dynamic urban community. Since we are all blessed with 20-20 hindsight, I do not mean to be critical of those who took what was believed to be appropriate action under the circumstances existing at some given time in the past. On the other hand, times change, problems change and so must our approach to the solution of these problems.

The time has come, I believe, when we must either strengthen the management capability and effectiveness of local units of government so they can cope with the needs of our time, or devise other means of handling the complex problems of our urban society. Many federal programs that have been developed in the past have involved the construction of public works. These have been implemented in large measure, by consulting engineers and private contractors. Federal funds, therefore, have not had the effect of increasing the managerial capacity and effectiveness of local units of government. It is conceivable that a stepped-up federal-aid program in the solid waste field could actually give local units of government the spark and incentive they need to upgrade the effectiveness of their entire organization.

I do not mean to rule out the possibility that many communities might find it advantageous to utilize the contract method of collecting and disposing of their solid wastes, but I do suggest that the development of an efficiently managed municipal refuse collection system could set a precedent which would lead to the establishment of sound management practices in other phases of municipal government. If this is to come about, however, it will require strong leadership on the part of municipal officials, in particular, and the streamlining of our decision-making machinery at the local level of government.

Bold action must be taken to strengthen the people's confidence in government and its ability to deal effectively with the complex problems that are created by rapidly changing times. Regulations serve as an effective means of controlling the future development of urban communities. Such regulations must be so designed as to control the impact of technological progress on urban communities and, at the same time, enable the urban dweller to reap the benefits of scientific advancements which will enhance his environment.

I commend the Kansas State Department of Health, The University of Kansas, the League of Kansas Municipalities and the U. S. Public Health Service for sponsoring this symposium. I also wish to commend those of you who have taken the time to attend this meeting. I hope you will find it to be both informative and stimulating and assure you that the APWA is ready and willing to work with you in any way it can to help you solve the solid waste problem in your respective communities.

Remarks of The Hon. Senator James B. Pearson*

It is indeed a sign of our time that a group of distinguished individuals and officials from state and local governments and universities would gather to discuss and to hear speeches from officials of the Federal Public Health Service, the Kansas State Department of Health, a city mayor, the university president, a state governor, and a U. S. Senator on the subject of, dare I use the word.....garbage. Actually, of course, this term solid wastes involves more than what we ordinarily think of as garbage, but I couldn't resist making that reference.

There is an old saying that you can learn more about individuals and societies by what they throw away than by what they keep. Americans do indeed "throw a lot away." This, of course, is not a personal trait peculiar to Americans but is a product of the highly urbanized and industrial society that we live in today.

It is almost unbelievable, but it is estimated, that as a nation, we spend approximately 3 billion dollars a year for public and private operations to collect and dispose of all the things we want to "throw away."

The sheer physical volume is staggering. Let me give you a few statistics to illustrate. If you mark off a mile square section of land, 640 acres, and build a 130 foot fence around it and begin to dump into it all the solid waste generated in this nation in a single day, this huge "garbage" pen would be overflowing by nightfall. Another example: If Kansas were to be designated as the nation's dump yard, and let me hasten to add that I am certainly not recommending this, the entire state would be covered with solid wastes to the height of a man's head in less than 10 years.

Solid waste accumulation presents problems that go far beyond the purely physical problem of disposal, staggering as it may be. Solid wastes disposal can be, and often is, an integral part of the overall problems of air and water pollution, preservation of scenic beauty, and many aspects of public health.

Let me say that as a member of the Subcommittee on Air and Water Pollution, and as a participant in a recently completed study which dealt, in part, with the problem of environmental contamination, I am keenly interested in this general concern over man's relationship to his environment, an environment which, out of necessity, we continue to alter.

*United States Senator - Kansas
(Paper presented by J. Lee Mayes, Kansas State Sanitary Engineer)

Solid waste collection and disposal is, of course, an inherently local concern, to be dealt with primarily by city and county governments. However, we have now reached the stage where I think we all recognize that the local communities need assistance from state and national governments. This need was recognized in the enactment of the Solid Waste Disposal Act of 1965. The enactment of this program does not change the basic fact that local governments have the primary responsibility in this area. What this Act does is to provide general assistance in the way of research, planning and training programs which may be utilized by local communities to better equip themselves to deal with their own particular problems.

I want to emphasize the word may, because most of the initiative must come from the local level. Except for certain general research and demonstration programs conducted by the Federal Government this legislation provides specific assistance only if requested and if needed.

Although I suppose one is never perfectly satisfied with a given piece of legislation, I think the principle here is sound, and is a good example of cooperative federalism; the Federal Government providing some of the means by which state and local governments can deal more effectively, if they take the initiative, with their problems than otherwise might be the case.

Let me shift gears now and speak more directly to the specifics of the Federal program provided by the 1965 legislation. I don't believe you would want me to give a detailed survey of the programs, and, in fact, the Federal Government's participation in this area is so new that the precise operational details are only now being finalized.

In this connection, however, I would like to call your attention to the Fact Sheet* which I prepared and had distributed for your information. I think you will find it to be a useful outline, and hope that in the future you will feel free to contact my office for further information as the need arises. You will also, of course, be hearing about the operational aspects of these new programs from other participants here today.

Although I won't attempt to review all phases of the program, I do want to take this opportunity to call your specific attention to items one and two, under the heading of "Major Program Activities" of the Fact Sheet. As you will note, these have to do with the awarding of Federal research and training grants to colleges and universities.

I wanted to direct your attention toward this phase of the program because it fits well with a strong conviction I have always had about the role of colleges and universities as institutions of community service.

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* See page 18

Now, of course, institutions of higher learning are, and must be, much more than vehicles of community service. But, I have always believed that a judicious combination of the broad goals and principles of higher learning and the practical programs of community service constitute one of the finest aspects of a college or a university's overall program.

Let me add parenthetically here that as our society and economy become evermore complex and integrated, the need for community service programs by our institutions of higher learning becomes ever greater.

Chancellor Wescoe has already commented on this theme and you will hear more about the possible role of colleges and universities in the "afternoon session" today. However, I want to suggest one concrete example of possible university participation, which is very likely to be overlooked.

We normally think of solid waste problems as associated with urban and industrial areas and I imagine that most of you here today are oriented toward the problems facing municipalities. But I think it worthwhile to point out that there are such things as agriculture wastes and that under certain conditions, the generation of these wastes and their disposal can create problems affecting broad community interests.

For example, we might point to the process of solid waste accumulation and disposal at commercial livestock feeding lots. Community livestock feeding, as you know, is one of the state's largest and most rapidly growing agricultural industries.

The Solid Wastes Disposal Act does provide for research, investigation, and demonstration grants to academic institutions and other appropriate public agencies relating to this matter of agriculture wastes.

It would seem to me that several of our state's colleges and universities would be ideally suited for the conduct of studies and investigations for the purpose of gaining and disseminating new and useful knowledge about the nature of feed lot wastes and biological and health implications, and the possibility of recovery and reuse of these waste materials for an economic purpose.

In closing, let me reemphasize that the Federal Government has not taken upon itself the task of solving the myriad problems associated with solid wastes. This is a local problem to be solved by the local community. What this new Federal program does is to create a greater opportunity for local communities, acting on their

own initiative to solve their problems. In effect, then, the basic task of solving these problems remains at the state and local level. This Symposium is an excellent example of the type of state and local initiative that is needed, and by our gathering here today, I am convinced that Kansas will be in the forefront dealing effectively and efficiently with this and other problems generated by the complexities of the era in which we live.

THIS FACT SHEET ON THE FEDERAL SOLID WASTE PROGRAM HAS BEEN PREPARED BY THE OFFICE OF SENATOR JAMES B. PEARSON

LEGISLATIVE AUTHORITY: Solid Waste Disposal Act of 1965 (Title II of Public Law 89-272), signed by the President on October 20, 1965.

PURPOSE: To initiate and accelerate a national research and development program for new and improved methods of proper and economic solid waste disposal, including studies directed toward the conservation of natural resources by reducing the amount of wastes and unsalvageable materials and by recovery and utilization of potential resources in solid wastes. To provide technical and financial assistance to State and local governments and interstate agencies in the planning, development, and conduct of solid waste disposal programs.

RESPONSIBLE FEDERAL AGENCIES: U. S. Department of Health, Education and Welfare, Public Health Service, Office of Solid Wastes, and the U. S. Department of the Interior. (Interior's program is limited to solid waste problems created by the extraction, processing, and utilization of minerals and fossil fuels.)

MAJOR PROGRAM ACTIVITIES: The Office of Solid Wastes is authorized to conduct research, training, and related programs, to provide technical assistance to State and local agencies, and to gather and disseminate basic information on the nature and extent of the national solid waste problem. The Office is further authorized to award grants-in-aid for a variety of activities in the solid waste field. --

1. grants for research, awarded primarily to colleges and universities and independent non-profit research institutions.
2. training grants to colleges and universities for the support of advanced, graduate level training in the solid waste field.
3. grants for studies, investigations, and demonstrations, awarded to public agencies and organizations, and to private non-profit organizations for work leading to or involving the demonstration of new and improved methods of solid waste collection, handling, and disposal, including the recovery and reuse of valuable components in solid wastes. Not more than two-thirds of the cost of such projects may be supported by Federal funds.
4. State and interstate survey and planning grants, awarded to official agencies which have been assigned sole responsibility for solid waste management within an entire State or interstate area. Federal funds may be used to support up to 50 percent of the cost of such surveys and planning, provided that the planning for which grant support is sought embraces appropriate consideration of such fields as public health, air and water pollution control, land use planning, needed expansion of State legislative

authority, State assistance to local agencies, etc.

FUNDS AVAILABLE:

OFFICE OF SOLID WASTES

	1966 (current) Fiscal Year	1967 Request
Research grants----	$ 859,000	$ 1,769,000
Training grants-----	150,000	350,000
Demonstration------ study, and investigation grants	2,000,000	5,000,000
Survey and planning-- grants	400,000	1,000,000
Direct operations----	994,000	4,250,000
Total	$4,403,000	$ 12,369,000

OTHER FEDERAL PROGRAMS: Under the authority of the "Housing and Urban Development Act of 1965" the Department of Housing and Urban Development can provide certain support for solid waste disposal programs when such programs are an element in broad-based, comprehensive urban planning.

REMARKS BY THE HONORABLE WM. H. AVERY

The State of Kansas has a long-standing interest in improving municipal refuse handling. As early as 1946 - 20 years ago - the State Department of Health in cooperation with the League of Kansas Municipalities made a survey of refuse practices in Kansas cities. Similar studies were made in 1950 and 1964.

An outbreak of typhus fever in Wichita in late 1947 resulted in the enactment of state legislation authorizing cities in the state to provide refuse collection and disposal services and to levy taxes, and service charges to finance such services. The state statute banning the insanitary and hazardous practice in the state.

In spite of these educational efforts and the enactment of permissive enabling legislation, the provision for sanitary storage, collection, and disposal of solid wastes continues to be a serious problem in many of our Kansas communities. The beauty of our landscape is being desecrated; the banks of our streams are being littered; our watercourses are being polluted with garbage and trash; our air is being contaminated with smoke and odors from burning dumps; and health continues to be endangered from the breeding of mosquitoes, flies, and rats.

Your governor and the state legislature are concerned about all these things.

No doubt you are aware that pollution of our rivers and streams was one of the principle items on the agenda at a meeting of the Midwest Governor's Conference during the month of February. While this did not deal principally with solid wastes, the need for clean water cuts across the distinction between solid wastes and other forms of pollution.

The Solid Waste Disposal Act makes it possible for state government to work with both the federal government and local agencies in seeking solutions to these problems. Such a coordinated and cooperative effort will undoubtedly be effective.

I am told that the most serious needs are related to planning, basic engineering studies, and better legislation relating to organization and administration of the services.

The agenda for this meeting indicates that all of these matters will be discussed in greater detail by others who are knowledgeable in these areas.

* Governor of Kansas

The enactment of the Solid Waste Act by Congress last year provides the State and local communities with funds to undertake much needed research, investigations, surveys and demonstrations; all designed to improve solid waste practices in the state. I am hopeful that all of you will take this opportunity and make the next decade a period of great advance in solving this problem.

When we stop to consider the sheer magnitude and the high cost of providing for the collection and disposal of wastes, we cannot help but recognize the basic need for our developing less costly and more efficient methods of providing this essential service. National studies by the American Public Works Association indicate that the average accumulation of solid wastes in the United States is approximately 4 pounds per person per day - 1460 lbs. per year, roughly 0.7 a ton. For Kansas that means 1,540,000 tons per year.

Kansas has been and will continue to be responsive to your legislative, fiscal, and administrative needs to adequately cope with this problem. In some other states, the use of county, inter-city or inter-county service districts has proved helpful. It may be that some enabling legislation is needed to encourage such cooperation.

I am deeply concerned about the ever-increasing littering of our highways and country roads, and stream banks. I receive considerable mail on the increasing problem of litter found along highways. Here again, it may be that present statutory statements are inadequate.

If annual conferences of this type would be helpful. I hope you will let Mr. Mayes and the sponsors of this conference know and I am sure that they will be more than glad to assist you in planning such an affair.

With certain limitations, the state universities are in position to help you by performing any research or investigations. I hope you will not hesitate to make your needs known to them.

I regard the League of Kansas Municipalities as an important integral part of the state family and I am sure that Ernie Mosher and his staff are much aware and interested in the solid waste problem.

Because of the League's knowledge and expertise in municipal management, it is in unique position to aid both local and state government in solving the solid waste problem.

It has been a privilege to speak to you on this important public problem and I will be interested in the results of your discussion.

THE STATUS OF SOLID WASTE DISPOSAL IN KANSAS

Ivan F. Shull *

It is doubtful that anything I say about the status of solid waste disposal in Kansas will be new or unknown to very many in this room. Most of you are concerned with, and knowledgeable about, the practices in your own community. Therefore, I shall not attempt to "sing a new song", but rather present the old facts in a new way that will cause all of us to "take a new lease on life" - and put our shoulders to the wheel with a determination to find a better way of handling discarded, unwanted materials emanating from our way of life.

One of the starting points for any improvement program is a clear definition of the present situation. It is with this purpose in mind that I pose the question:

What is the status of solid waste disposal in Kansas in 1966? One might answer this question in a number of ways such as: terrible, unsatisfactory, antiquated, chaotic, disgraceful, or wasteful. While all of these terms are doubtless partially correct, none of them is completely accurate, and few of them are helpful in pointing out the course of action we should take to improve the situation.

So with a firm conviction that "it is better to light a candle than to curse the darkness" I will attempt, in the next few minutes, to indicate, in a general way, some of the impressions I have gained from "walking to and fro" across our state many times during the last twenty years. I am hopeful that these impressions will suggest the size and nature of the task that lies ahead in improving solid waste disposal practices in Kansas communities.

First, one gets a feeling that many city officials, particularly those in our smaller communities (with populations of 10,000 or less) wish to avoid becoming involved in any way with refuse. They say "Let the property owner worry about it." As a result of this aversion, the alleys, backyards, and vacant lots in these communities too often present a disarray of litter, malfunctioning trash burners, and a wide variety of garbage containers, some bad and others not so bad, but none very good. Overcoming this apathy, indifference and aversion toward the solid waste problem in the minds of public officials is a primary need. Recognition of solid waste handling as a community responsibility is essential.

Secondly, in many of our larger urban communities one is likely to find a wide assortment of private, public and semi-public agencies engaged in and competing for the collection of refuse. Under this highly competitive arrangement, few are able or willing to invest the capital needed to provide acceptable equipment and adequate service. Disposal tends to operate on a haphazard basis with no long-range plan for handling the solid wastes of the community. One gets a feeling that solid waste disposal programs in these communities operate on a "crisis to crisis" basis. Very little serious thought is being given to the development of a sound plan for waste disposal that will result in utilization of the disposal site for community parks, playgrounds or just plain open space. In many instances a rough abandoned piece of land is offered to the city by the owner for a refuse disposal site for a dollar a year, provided the land is returned to him following completion of the filling operation. Benefits of any improvement of site due to filling and grading are passed on to the owner. There are good reasons for this type of arrangement and Mayor Wright will doubtless touch on them in his remarks a little later today. They do, however, have some serious limitations which merit critical examination.

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*Chief General Engineering & Sanitation
Kansas State Department of Health

There is in our larger cities a trend toward municipally operated collection services. Any centralization of responsibility for collection in either public or private agencies is a step in the right direction that will greatly simplify planning and operation of the solid waste disposal facility be it a sanitary landfill, incinerator or compost plant. Operating a solid waste disposal facility to meet the whims and fancies of John Q. Citizen, who expects the disposal site to be accessible 24 hours a day 7 days a week, is no small task. So the trend toward a municipally operated, tax-supported refuse collection service, slow as it is, is encouraging.

The banishment of "hog-feeding of garbage" and the installation of garbage grinders in the newer homes has increased the use of combined storage and collection of trash and garbage. Such combined collection will produce sizable savings in collection costs in most communities. Discharge of garbage to the sewers has permitted some cities to reduce the frequency of collection to one collection per week.

Burning of combustible materials at the dump sites is a common practice. Junk yards along our highways are full of abandoned automobiles and farm machinery and are an infallible announcement of the approach to many Kansas hamlets. Around our larger cities this disarray of abandoned metal covers acres upon acres, a grim reminder of our wasteful and slovenly ways.

There are a few bright spots in the state that give one relief from the drab repetitive patterns. The experiment at Junction City with paper bag containers is refreshing because it indicates an interest in finding "a better way". The recent changes in disposal practices at Dodge City - away from dumping to incineration - is also an interesting development. I cannot vouch for the adequacy of either of these innovations but it is encouraging to see communities willing to explore new ways.

Impressions from another important segment, the suburban fringe areas around our growing cities, should be mentioned. In these half city-half country areas there is no governmental agency authorized to provide refuse collection or disposal services of any kind. So you find all kinds of arrangements from homes associations to voluntary service contracts, to self-service.

Responsibility for collection and disposal of solid wastes in these areas is legally, and in reality, an individual family matter. Result: chaos.

As our leisure time increases, and more and more of our families spend more and more of their time along streams in isolated rural areas, we can expect public indignation to arise among Kansas citizens over the littering of the countryside with trash, rubbish and garbage. This can and will be stopped only when adequate disposal facilities are provided in every community. Such facilities do not exist today.

Well, this is what I have observed, this is what I have heard, and this is what I have concluded.

1. Cities and county governments have failed to recognize solid waste collection and disposal as a community responsibility and to develop some procedures for providing needed services.

2. Few, if any, communities have made any in-depth studies of their solid waste disposal problems or developed any truly long-range plans for meeting the solid waste disposal needs of the community.

3. There is in the state a large reservoir of public interest in improving solid waste disposal practices. While much of this interest may be latent and passive at present, it could be easily marshalled to support a properly planned program for improving community solid waste disposal practices in the state.

4. Lack of minimum state requirements for solid waste programs such as we have for public water supplies, public sewerage systems, hospitals, and many other community undertakings leaves local officials without any support or guidelines. Such minimum standards are needed.

PROBLEMS IN PROVIDING ADEQUATE COMMUNITY SOLID WASTE SERVICES

Honorable Charles W. Wright, Jr.*

Before beginning my presentation on this subject I want to congratulate Lee Mayes, Ivan Shull, and all who have helped to create today's Symposium. In my opinion, it is something long overdue. Proper disposal of solid wastes should be as important to all people, as it is to us in this room. It is time we unwrap this big problem -- and work to solve it.

Solid waste disposal is very much like sex. Covered up it's not a particularly pleasing thing, but uncover the subject, and amazing things begin to happen. I'm sure all of you can remember years ago when it was crude to discuss sex. People just didn't talk openly about it. Then someone decided sex should be exposed and particularly the young people educated properly about it. True, there seems to be too much emphasis on sex today, but compare that to what the public, and a lot of public officials too for that matter, do not know today about Solid Waste disposal.

It's significant to note here that the first National Conference on Solid Waste Research was not held until December, 1963, only 2 years ago, so you can see that we are still living in the "dark age" on this problem. We need to hold more of these Symposiums, with the general public invited to them as well as public officials.

I could end my speech right here by saying that people create our problems in solid waste disposal. If one could find something or some way to solve people, the waste disposal problem could be easily solved. In other words, take people out of the picture, and you simply have no problem at all.

But, we have to live with people and we have to live with their problems. The manner in which we live with people, I believe, determines how complex our solid waste disposal problems will be. In this talk I'm not only going to present problems, but also how I believe they can be solved. Since all people are different, it follows that their municipalities are different. But, basically the solid waste problem is the same -- in your city, your county, our state, and all municipalities throughout the country.

People today are not trash conscious. In an excellent article on page 46 of the March issue of Today's Health, entitled "Solid Wastes: Every Day, Another 800 Million pounds," Sheldon Mix starts off by saying, "Most Urban Americans neither know nor care what happens to their refuse once the garbage collectors pick it up, so it's not surprising if they're also unaware that the toughest problem in the field of public works today is disposing of solid waste."

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* Mayor of Topeka, Kansas

And, I might add here, that too many public officials are not yet awake to this big problem. If they were, there would be several hundred of them here today, not just a few. Frankly, the problems I faced and will tell you about today, were compounded by public officials who had a "don't give a damn" attitude on solid waste disposal, and they still have not changed.

When I was first elected Topeka Street Commissioner in 1961, I'll never forget the sign which greeted me on my office desk, that said, "Problems Are The Reason For Your Job." I smiled at it then, but 4 years later I was ready to tear it into shreds. Problems were not only the reason for my job--they were my job, 24 hours a day, 7 days a week. I well remember bowing my head to pray in church one Sunday, as a quaint little old lady sitting next to me said, "Mr. Wright, they didn't pick up my garbage last week." I seem to recall that I started my silent prayer with, "O God, deliver me from my problems, even those seated in this church."

Of the four departments I administered as Street Commissioner, the Refuse Department was by far my biggest problem. Prior to 1956 the City of Topeka had contracted with a private firm for garbage pickup once a week. Because our Health Department had too many problems with this service, the City set up its own Refuse Department in 1956. None of the 5 City Commission members wanted responsibility for the department, but they finally saddled the Street Commissioner with it. They gave him little money, so the department started out as a stepchild from its inception. By the time I left office last spring, I had the department on its feet, with most of the problems solved. But, let me tell you the 4 year story as it happened to me.

First, my biggest problem was finances. The department was operating on a shoestring. We were collecting 1.35 a month from residential customers and giving them 2 pickups a week. The equipment we had was held together by baling wire and the welder's torch. We needed money badly. Our financial woe was compounded by the fact that nearly 6,000 installed garbage grinders were ruled to be exempt from garbage fees, so we only collected 75 cents per month from these customers.

I suggested to the City Commission we raise the fees. This met with immediate opposition from my Commission colleagues, primarily because they were all retired men, and retired people on limited incomes just don't believe in raising anything.

To get around this I named an impartial citizens committee to completely study the entire Refuse Department. Of course, I chose committee members who were impartial, but who were among my strongest supporters. They did a marvelous job of study, and recommended a raise in fees. The City Commission relented and raised the rates to $1.60 per month; 60 cents for garbage and $1.00 for trash. We now could place our equipment on a replacement schedule. We had money, but we still could use more. With my equipment problem mostly solved, I turned to the personnel problem.

Knowing I couldn't get college graduates to staff the department, I realized we were dealing with unskilled, uneducated labor. But, I found one thing which made sense to me. Practically every man in the department liked his job. They wanted to be a truck driver or a garbage collector. Some employees didn't care about their job, so I got rid of them, combined some routes, and divided their salaries up to provide pay raises for the others.

Until I arrived, the department had been hiring employees with no regard to physical fitness. I was amazed to learn we bought a piece of equipment only after we knew all of its capabilities, yet we hired men if they just looked tall enough or strong enough.

I met with directors of our Topeka Medical Center. I told them I wanted them to choose 3 doctors, to whom every applicant for a Refuse job would be sent. These doctors were to completely examine every man, and report their findings to me. I wanted to know what made every man tick, and why. This made Christians out of a lot of would be Workmens Compensation claims. When they applied with bad hearts, backs, etc., and learned they had to take a physical, they left.

The Finance Commissioner was furious when I handed him the first physical examination bill for only $37.50. He thought I was nuts, spending that much on one man just for a physical. Too bad he wasn't around a couple of weeks ago to see the nice fat refund check the department received on Workmens Compensation, the first time in the department's history this refund had ever been made.

To go along with the physical fitness program, I initiated an employee safety program, a job training program, and many other job benefits, including paid holidays. I gave each man, regardless of his lowly status, a pride in his job. I counselled with all of them frequently, complimenting those with good work and safety records. I learned their names, took a personal interest in their families, and treated every man like a human being, not an animal. I found that this went a long way in solving problems of job absenteeism, questionable sickness, job laxity, and job mortality. In a year our job mortality rate fell from 85 per cent to less than 15 per cent. Every man fought for his job . . . and more important, he did his job to completely satisfy our customers, which after all was the biggest test. Our customer complaints decidedly dropped, and the public's attitude was behind us, not in front of us.

With my financial and personnel problems in the Refuse department pretty well solved, I turned to the real sticky problem--disposal. It was more than sticky; it was damn discouraging, but with guts and determination, I solved it.

For years, Topeka had used the sanitary landfill method for solid waste disposal, principally because there were so many areas in and near the city which could be reclaimed and made usable. The Refuse department's record of efficient operation of sanitary landfills was brilliant. At no time had it been necessary for the Health department to even warn the department about landfill laxity. The Refuse department had many campaign ribbons without battle stars. Unfortunately, this was soon to change.

When I took office in 1961, the department's only sanitary landfill was located on City property, near our Sewage Disposal plant on the east side of Topeka. To help you locate it, I have designated it on this map. Please note its proximity to our Municipal Airport, for I shall refer to that again.

At this same time there was an area here which years ago had been a brickyard. The property owner had started to fill it in with unburnable trash - no garbage. As the fill progressed slowly, thousands of fish died in the ponded water from lack of oxygen and pollution of the water. In august, 1961, it had become a truly putrid area. Something had to be done fast. The Health department prevailed upon the property owner to let us make it a sanitary landfill. He reluctantly consented, primarily because the area was very close to some of Topeka's most expensive homes, and across the street from one of its most beautiful cemeteries. While there had been plenty of odor before, once we started our landfill the odor was quickly covered. Our only problem was blowing paper, especially into the cemetery. We had to frequently send men out to comb the area and pick up the paper.

For nearly two years, this sanitary landfill was used for disposal of all of Topeka's residential trash and garbage. We never had one complaint from anyone including the Health department. And remember, it was located near an exclusive residential area on Topeka's west side.

As our landfill at this location neared completion, we looked for another site, on the south or west sides of Topeka, near our areas of heaviest daily pickup. We wanted to cut down on our operating costs by reducing the mileage of our trucks from pickup to landfill sites.

Since our search wasn't too successful, we pulled back to our East Topeka site. Meanwhile, we learned about the availability of an old rock quarry just east of Forbes Air Force Base. Thousands of tons of rock had been quarried from it to build the air base. It was fairly close to south Topeka, and readily accessible to west Topeka. We secured the property owner's permission verbally, and moved in. Two weeks later we moved out - back to the East Topeka site.

Again I refer to Sheldon Mix's article about public apathy. "Homeowners seem to show interest in solid waste disposal only if somebody wants to establish a sanitary landfill project near their property. Not long ago there was a public meeting in a city in Northern Illinois to discuss the broad policies of refuse disposal. Twelve people showed up in an area of 300,000 population. But at a different kind of meeting, in a small town where a private scavenger was trying to get approval for a sanitary landfill, 600 people appeared, out of a population of 2300. Naturally they were all oppoed; and they booed and hissed. Scare literature had helped inflame them. It told the town's residents they would get polio from the sanitary landfill, that rats would gnaw at their children's ankles as they walked to school. None of this is true, but then, refuse disposal is the most misunderstood subject I know of."

People who lived at least a half a mile from the site near the Air Base were complaining because the trucks were going by their houses. It made little difference that our trucks were covered, gave off no odor at all, and respected the traffic regulations. These county people just didn't like trash trucks coming out to their area. They had learned to love the hundreds of smelly cattle trucks driving by, but not our clean Refuse trucks.

They appealed to their County Commissioners, and people living miles from the site joined the fight. A mile east was the town of Berryton. They complained about pollution of their water, although their complaints were unfounded.

The Air Force got into the act. Base officials complained that smoke from our landfill would endanger their pilots lives, even though I repeatedly stated there would be no burning. They concocted stories of flocks of birds being caught in jet airplane engines. They pressured the Chamber of Commerce, who in turn pressured the City Commission, who in turn pressured me. When I tried to explain a sanitary landfill to everyone--that there would be no odor, smoke, or birds, my explanations fell on deaf ears. No one wanted a "smelly old dump near them." I tried to point out that neither the Air Base or Berryton had anything but a smelly open dump, rather than a landfill, but no one could hear me. Why? Simply because no one had presold them on the advantages of a sanitary landfill. No one had presented them the facts first. Their first impressions were lasting ones, and they defeated us.

So, back to the East Topeka landfill we went. By now, it was nearing completion, so we had to do something fast.

We considered an incinerator, but with so many abandoned rock quarries available, and the prohibitive cost of an incinerator, we decided to stay with the landfill program.

I secured a verbal agreement from the owner of a huge abandoned quarry west of Topeka, located here. We applied for a building permit to build a shed for our bulldozer at this location, and again the County Commissioners learned of our plan. The closest home was more than a half a mile away and the proposed site was surrounded by nothing but farm land. To be sure, there were more smelly manure piles and hog pens in the area, but to the area's residents, these smelled like perfume compared to that of a dump, which they all believed we were trying to establish.

I took colored movies of sanitary landfill sites throughout the city, showing their beauty and usefulness today. I took movies of the desolate area we were proposing for the new sanitary landfill. I didn't need to flavor the latter, for it had been used for years as a place for anybody to dump everything. Thousands of cans were strewn all over, desolation was everywhere. It couldn't even be used as a wildlife sanctuary--it was too desolate and wild for that.

I rented a nearby school, invited everyone to attend. I showed my movies, and courteously answered their indignant questions. I got nowhere. Again, they were there to vent their spleen on me and the city for wanting to blight their area with a "damn old dump." They said they knew all about sanitary landfills, and didn't need me to tell them about a sanitary landfill.

They repeatedly referred to the "smelly old dump" on Gage, yet I reminded all of them that they did not complain to us when it was operating. They mentioned the stink from it, yet I reminded them the stink came from fish that died before the area was turned into a sanitary landfill. They were really confused. The more they objected, the sillier the whole affair got to be. Actually, at several points I felt like laughing at them in their stupidity. They even objected to our trucks going by a school, yet in the City our trucks went by schools all the time.

Then the Planning Commission got into the act. They decided I could not locate a sanitary landfill on any land until it was zoned for industrial use. At no time in the past had zoning ever appeared, principally because our sanitary landfills were not permanent use of land, but only temporary.

I beat them with this point, so they decided to give me more trouble by requesting a Special Permit instead. But, the Special Permit could only be granted if my application was accompanied by a report prepared by a registered engineer pertaining to the proposed site and operational procedure to be employed. General definition: The depositing of refuse, including trash, rubbish and garbage, in a natural or man-made depression in the earth or at ground level, compacting it to the smallest practical volume and covering it daily with compacted earth in a sanitary manner with adequate health, safety and welfare by controlling:

(a) Dust from the fill and access roads.
(b) The horborage of rats, flies and other vermin.
(c) Air pollution by smoke or odor.
(d) Fires, both surface and underground.
(e) Pollution of surface and ground waters.
(f) Excess noise.

All property owners within one thousand (1,000) feet in the County and two hundred (200) feet within the City were to be notified of a proposed sanitary land fill, by the Planning department.

About the only thing I didn't have to do was show the location of the portable toilet.

So, I contacted the firm of then Servic, VanDoren and Hazard in Topeka and asked them to give me a proposal on what they would charge for such a study. They had never made such a study but when they gave me their proposal, the Finance Commissioner, who was a self-styled expert on anything, accused me of employing this firm without authority to do so. I tried in vain to assure him and the City Commission that no one had been hired. The City Commission instructed me to use our City Engineering and City-County Health departments for such a study. Neither of these departments had ever made such a study either, but they assured the Commission they could do it in 60 days. Four months later I was still waiting for the study, and my East Topeka landfill was more than full.

Finally, well armed with all of the requested reports, I applied for two Special Permits at these two sites (near Forbes Air Base, and on Indian Creek road). I felt confident, and I desperately needed someplace to put over 200 tons of daily refuse.

The public hearing was more like a hanging. Everyone showed up to see me crucified. It was better than a circus, yet lacked a concessionaire. The Refuse Director and I were the only two city people appearing to plead our case. None of my fellow Commissioners took the time or had the guts to help me. After all, it was my problem, not the City's. Seriously, I don't believe they had any idea of what a sanitary landfill was. I could see them sitting in their offices, gloating over the public ridicule I was taking.

The Planning Commission heard every objection. To me, it was like hearing the number one tune on the Hit Parade. I was personally insulted. I was accused of being malfeasant in office. Meanwhile, all I could hear was our 20 refuse trucks driving around town in a world all their own. No one loved them, and certainly didn't love me.

I was not surprised that the Planning Commission denied my request for Special Permits. I accused them of "hiding their heads in the sand", and they presented me with a genuine Ostrich egg. Their record is still clean, for they still haven't issued a Special Permit for a Sanitary Landfill in Topeka.

My East Topeka landfill was really full now. To add to my plight, our esteemed Mayor at that time had told Central Airlines about the Air Force's objections to my landfill near Forbes. Since the East Topeka one was close to the only instrument runway at our Municipal Airport, Central raised plenty of stink about our one and only operating landfill. So, the City Commission ordered me to move---

One morning I got up, determined to lock the problem. I hated everyone who lived west of Topeka for what they had done to me, so I got in my car and drove west, outside the 3 mile limit. I quickly found the answer to my prayer. An area of about 20 acres located on a state highway, and just beyond the 3 mile limit. The property owner was overjoyed to think that he could get a landscape problem solved so easily. Once we moved in, literally thumbing our noses at all west siders, everyone was mad but the property owner, the Refuse department and me.

No one could touch us legally, although everyone tried. I told our boys to operate strictly by the book, yet we took no time to get Engineer or Health department reports. We didn't have time to get these reports.

Today the Topeka Sanitary Landfill problem is solved for many years to come. We made believers out of non-believers. In fact, we have had many of our opponents plead for us to come back in these 2 areas and fill them. This area has just recently been the scene of wild youth sex parties. As far as I'm concerned, I could care less, for we are now building a Central Refuse Collection Station, from which semi-trailer vans will haul refuse collected at one point from the smaller trucks, to desolate areas farther out in the county.

All of my landfill problems could have been solved by a public relations program. In fact, quoting again from the article in Today's Health, "Public understanding of the solid waste disposal problem is a must".

In his paper presented to the 1964 American Public Works Convention, Jay Vanderveld, Jr., Executive Vice President of National Disposal Contractors, Barrington, Illinois, said, "As we progress with sanitary landfills, properly engineered and properly operated, we then should conduct a strong public relations program, even to the point of hiring professional publicity people and soliciting newspaper support. If possible, it is smart public relations to have an artist show what the site will look like upon completion. In fact, if any subject or product needs a professional public relations program, I am sure you will all agree that garbage does."

Gentlemen, if you need such help in your community, I would welcome the opportunity to discuss it with you.

Recognizing the need for a professional public relations firm in Kansas for this work, I have decided to initiate such a service. With my past experience in public relations before holding public office; my just recent 4 years in solving solid waste disposal problems; and my first-hand knowledge of city operations, I certainly feel I am well qualified to help you professionally.

It has been a pleasure for me to appear on today's program, and again want to thank Ivan Shull for allowing me to do so.

Thank you.

THE IMPLEMENTATION OF THE SOLID WASTE DISPOSAL ACT, 1965

Wesley E. Gilbertson *

It's a real pleasure to be here, ladies and gentlemen. I have been especially pleased to observe that this meeting is sponsored by the University, the Department of Civil Engineering, the League of Kansas Municipalities, the State Department of Health, and the Public Health Service. I think that this is a very good illustration of the interrelationships involved in our national solid wastes program.

I was in Kansas City last fall for the American Society of Civil Engineers meeting, shortly after enactment of the Solid Waste Disposal Act, and I had the pleasure of addressing the environmental engineering session. I observed then that five years ago we probably couldn't have gotten three engineers together in the back corner to talk about solid wastes and here we were with an overflow crowd. The other day this same point came to my mind when we had a ceremony for the signing of an agreement with the Tennessee Valley Authority and Johnson City, Tennessee for a research-demonstration project on composting sewage sludge and municipal waste. At that meeting we had the Congressman from that district, the Surgeon General of the Public Health Service, and the Director of Health and Safety of TVA. It is very heartening to see that you can pull top level people together around this problem of solid wastes as here, with Senator Pearson, Governor Avery and other outstanding people joining us at this meeting. People generally and the professions, in particular, clearly are concerned about cleaning up the environment and certainly solid wastes are an important aspect of this complex problem.

I have an assigned topic, "The Implementation of the Solid Waste Disposal Act, 1965." I suppose it is pretty early in this game to nail down a lot of things, but I think there are enough specifics at hand to be helpful to today's meeting. Specific provisions of the Act were well covered in previous talks and the information provided by Senator Pearson's office, I, therefore, will confine myself to the underlying philosophy here of our approach to the solid wastes problem, a few of the concrete actions we already have taken, and some observations about the future.

I have said, and I haven't been challenged yet, that the Solid Waste Disposal Act is one of the most mature acts relating to the environment that has been enacted so far by the Congress. I say that for this very important reason. This is the only one of the acts that relates to any problem of the environment that really says anything about the other problems of the environment. In other words, this is clear recognition on the part of the Congress that one part of the environment impinges on other parts of the environment. In this

Act we are specifically admonished and required to take into consideration the effects of solid wastes problem solutions on air and water pollution and on urban and metropolitan development generally. Moreover, the way in which this Act was put together implies a good deal more than just looking for a way to control or dispose of a waste material. There is a very strong emphasis in the Act, the hearings, and the report that conversion and utilization of wastes is the direction in which we must go today. In many places in this country we are running out of land for landfill and so we have to think about ways to make use of these materials themselves and recycle them back into our economy, or use the heat values which are there. This really is advanced thinking about the waste problem.

I also would like to emphasize that there is an extremely strong admonition in this legislation for reexamination of the question of the level of government at which waste management operations should be carried out. Reference has already been made this morning to the need for interlocal collaboration. I was encouraged to hear the Governor mention that he thought that perhaps some legislation in Kansas would be desirable in order to permit counties and groups of communities to band together and tackle this problem. From a strictly engineering point of view, this produces certainly some new challenges. It also gives rise to an opportunity to look at this operation not only from the economic standpoint, but from the point of view of the politician and the public administrator. It certainly presents some challenges as to how you organize politically and financially to undertake a combined type of operation. This again is a recognition of change in our time and, I submit, an example of maturity in legislation.

I want to emphasize also that there is a very strong orientation in this legislation toward innovation not only in terms of technology which is extremely important, but also organizational and financial innovation. Much of the work that we foresse is in the area of working out and testing and trying and demonstrating and applying new approaches.

In order to keep within time limits, I would like now to pass to a few specific actions we have taken and give you a status report of where we are now and an indication of further steps.

The Act was passed very late in the last Congressional session, signed by the President on October 20, 1965, and we were able, just before adjournment, to obtain an appropriation to start work. The initial appropriation, as was indicated in the fact sheet, amounted to $4 million of which about $3 million was for various grants and the balance for contracts and direct operation. The $4 million represented only a part of the actual legal authorization for the first year of operation. The law provided for $7 million for the first year, but $4 million was appropriated in view of the fact that a good part of the year had passed. The President's budget for the next fiscal year includes $12.3 million for the operation of which again something like three-quarters is for the grant part of the program -- the rest for contracts and direct operations.

We were very fortunate in the fact that some very good ground work had been performed through the research grants program. Also, under Ross McKinney's chairmanship, we had held the Solid Wastes Research Conference in December 1963 which was very fortuitous in that it did provide a forum for research people some of whom have not been acquainted with this field before. In any event, we were able to move very rapidly on the first year's work in the research grant field and I am pleased to say that we have on hand some 22 applications for research grants pretty well scattered all over the country. These are high quality projects and those which are unfunded this year will be carried over to the next year, so we foresee then the activation of a good sized research program through the universities and research institutions without any delay.

Furthermore, in response to very definite and important needs within manpower training, we have received seven applications from universities for graduate training grants in solid wastes. These represent a cross section of departments -- civil engineering, chemical engineering departments, public health, and others representing different concepts and approaches to graduate training in solid wastes management. The applications are now under consideration and I feel sure that at least one-half will be funded during the current year so that next year there will be some new solid waste curricula under way with the assistance of grants.

There are two other types of grant provisions in the Act both of which are new and required the development of policies and administrative procedures and all the other things, forms and whatnot, that are a part of any new piece of legislation and the program authorized by it. One of these is the program for grants for demonstrations, studies and investigations. The other is the program of grants to States and State agencies for planning. Taking the latter one first, the purpose here is to provide a matching program of grants to States and interstate agencies. To my knowledge there are no interstate agencies at the present time for initiating a broad comprehensive program. This, of course, requires legal authorizations such as the one the Governor mentioned this morning, so that communities can go ahead and do their part of the job in establishing the necessary administrative framework and making a study of total waste disposal problems -- urban, agricultural, and industrial -- to determine the feasibility of regional disposal operations. This we believe to be a sound way of moving ahead and getting an adequate State program under way. According to information that the Conference of State Sanitary Engineers pulled together a year or two ago, I think there are less than a dozen States that really have significant programs in this field, so that the availability of these grants to initiate work at the State level to work with the communities, as well as discharge the State responsibilities, is very important. Secretary Gardner, incidentally, has addressed letters to all of the Governors and other appropriate officials in the States asking that a State agency be designated for this work.

The other program, namely the one to support demonstrations, studies, and investigations, will get a good deal of emphasis. Our long-range projections provide that about half of the total money authorized will go into these projects. These represent what I would call the practical end of the business and certainly one of our key objectives here is to expedite translation of research results into application -- to shorten the time gap between research and field operations.

In this part of the program, Federal grants are authorized for up to two-thirds of project costs. The law further authorizes grants to assist with construction of facilities where these are needed in connection with demonstration projects. In other words, we can move through the total system from the research idea, through the later studies and the pilot plant operation and move into the hardware. By hardware we mean operating-scale facilities, not necessarily big enough to take care of the problems of cities with a million population, or more, but facilities which will handle 100 tons a day. The variety of facilities, I would think, would be limited only by what comes out of research.

The authorization for study and investigation grants provides a way to funnel financial assistance into situations where, say, a number of communities are thinking about getting together on a regional basis but they haven't quite worked out all the problems and a study of the regional approach might be needed to turn their idea into reality. Again, there will be local problems of national significance and a study grant might provide a way in which we can support an activity of wide value.

Now these are the grants activities. In addition, we do plan to carry out and are in the process of planning and organizing the direct operations of the program. We expect to have some staff in our regional offices and to implement a modest research program at the Sanitary Engineering Center in Cincinnati, Ohio or at some future facility in the area. Also, we would expect to use such a center as a base for technical services.

I would like to say here that we do not visualize these demonstration projects as activities which we write a check for and then forget. We visualize these as real, active, growing operations available for inspections by municipal or university people from anywhere in the country. Acceptance of the grant implies acceptance also of the fact that the money is to be used for a real demonstration facility intended to help others achieve technological improvement. We also feel that it would be highly desirable for us to use these projects, where feasible, for further experimentation or investigation. Since they will be operating-scale projects they will approximate reality to a degree you can't achieve in any other way, particularly with respect to engineering and economic problems. So we expect to be able to follow through on these projects and get as much information as we can out, so that this, in turn, can be used on a national basis.

Up to the present I haven't mentioned the role of private enterprise. I can tell you that we visualize this role as very important for a number of reasons. In the first place, we have the obvious interest of the consulting engineering profession. Moreover, a significant segment of the whole national field of solid waste disposal is now being conducted by private enterprise. Without getting into the question of whether this should be wholly a public, or divided, or wholly private operation, let's say we have to recognize facts for what they are and private operations, I think, will continue to be an extremely important factor. Certainly no adequate planning can be done at either State or local level without recognizing that there are large private operations going, some of which are somewhat like a public utility in the community, but which are wholly without the normal protective mechanisms with which we surround a public utility. Also, we have the very important question of the effective use of industry research and development capability. I can tell you that the interest expressed by people such as you in coming to a meeting like this is equalled by the interests by very capable large-scale industrial research and development and engineering firms. We have had a number of contacts with these people and there is no question but what they feel that some of their know-how should be put to work on the solid wastes problem. We are encouraging them. We greatly need new ideas and will welcome the help of anyone who has them.

Mention has been made here of the situation in this part of the country with regard to agricultural practice. Some people call this the conflict of the rural-urban interface. This is kind of a fancy way of saying that the farmers don't want the city's garbage on their front doorsteps anymore. Our view is that, in the long run, the agricultural-urban problems are going to have to be considered more one problem than separate problems. A number of very interesting experiments are now being conducted on total systems which include rural areas and the urban areas and this I think gets at some of the very difficult questions with respect to whether or not we can do not only an adequate disposal job, but be able to maintain, or restore, natural beauty.

Another problem concerns management, and I am one hundred percent behind this as a really important matter. Management, I think, can encompass a number of different aspects of the total problem. For example, there is the very definite question of the public works business management, including personnel management and equipment purchases. These are all tough problems and they have got to be tackled. Whatever we can do we expect to keep pushing on and this can, and should, be done through a variety of means. I think wastes management, for example, can be built into university curricula. I think it can be built into the training courses the American Public Works Association will be conducting for operations personnel. Certainly, we expect to emphasize it in some of our own training. Our whole attitude on this needs to be upgraded.

There is another kind of wastes management involving environmental considerations. Here we look at the solid waste problem not simply as a matter of disposing of daily quantities of materials, but in context with water and air and metropolitan development and all of these in terms of effects on the environment, on the healthfulness of living conditions, on natural beauty, on economics, and on industry. This becomes a very complex area in which to make progress. It is difficult, for instance, to put a price tag on the social values of aesthetics, and yet every day that goes by aesthetics are becoming more and more tangible for people and we have just got to build these values into our management system so when we are talking about management, we are talking about very broad questions which we must consider.

I think that this perhaps is about as far as I am able to go at the moment in terms of giving you a progress report on implementation of this program. The enormity of the problem will require very careful planning and program development in order that available funds will be used in the best possible way. We expect to utilize advice and consultation of people from all walks of life and from many organizations in working out the best possible approaches.

It certainly is a pleasure to be here and to take part in this program. I believe that your thinking is in the right direction and I want to wish you every success. Thank you very much.

LONG-RANGE COMMUNITY PLANNING

Richard W. Eldredge *

One of the prime requirements for long-range community plans is the assurance that the plan will become a living, growing tool outlining the community program in refuse disposal. Continual revisions are required in any plan to accommodate new methods, techniques, or changes in community approach. However, do not confuse plan revision and plan growth with the warping of the plan that may take place when arbitary decisions are made which are contrary to the plan.

The objectives of a community plan may be summarized as follows:

1. To establish responsibility for the planning and implementation of solid waste activities.
2. To evaluate current problems and forecast solid waste disposal needs.
3. Develop a long-range plan, coordinating local solid waste activities into a feasible, comprehensive and cohesive plan for the community.
4. To provide guidelines for implementing of solid waste disposal plans and provide continuing technical reference through which solid waste disposal agencies may obtain guidance.

Data Collection and Analysis

The planning agency should have or obtain capability to collect and analyze all the data required for the plan development. Unfortunately, reliable data upon which solid waste plans may be based is generally unavailable. The planning agency may have to devise ways and means of assessing solid waste storage, collection, and disposal, including the development and application of suitable measurement standards.

Evaluation

The planning agency should evaluate data on a community-wide basis, including all sources and types of solid waste. Seasonal variations should be considered as well as costs and adequacy of service. But then what is adequate with respect to public health? With respect to service required? With respect to cost? With respect to jurisdictional coverage?

These requirements should be established and the total planning program oriented in such a way as to assure satisfaction.

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In order to develop effective long-range plans for solid waste disposal in the community, the planning agency will require an evaluation of current practices on the broad range of solid waste disposal activities. For effective planning, forecasts should be made for a minimum planning period of twenty years. Specific items on which forecasts are required in order to provide solid waste prospects with some degree of reliability are:

1. Local, regional, and statewide population increases.
2. Quantity, type, and cost increases.
3. Land use and zoning plans.
4. Pending or potential legislation.
5. Population density and development of metropolitan areas.
6. Industrial growth patterns.
7. Recreational development plans.
8. Agricultural needs.

Suppose we make our forecasts and prepare our plans. What are some of the factors which should be rechecked.

1. What are the real limits of the community? Does the plan include all of the community? Don't count on political boundaries or geographical conditions to delineate these limits for you.

2. Does this plan form an integral part of the State's solid waste plan? If not, why not? Is it because the community did not adequately contribute information to the State planning program as it progressed? Don't count on the State plan expressing actual local conditions or requirements unless the community has cooperated in the data-gathering phase of the State plan. Maintenance of continual contact with respect to any community changes affecting refuse disposal activities is a must.

3. Is the plan realistic? Does it set goals that are financially obtainable? Can it be accomplished on the schedule proposed? Don't count too heavily on funds that may be available if major changes in legislation or legislative actions occur. Don't plan so far in the future that design quantities produce large, hardly-used facilities, worn out by age rather than use. Don't plan only for today's quantities; in actual practice, the facilities will be unbearably stressed with tomorrow's quantities.

What is the most difficult portion of a community plan? The most difficult determination involves the establishment of community limits.

Webster's Dictionary defines community as "a commonwealth or State" and as a "town, village or neighborhood." For our purposes, the answer lies somewhere in between -- neither State nor village, but an area whose solid waste problems are interrelated and interdependent one to another. The establishment of exact limits of the community should be made carefully, weighing the inter-relationships and inter-dependencies, existing or desirable, discarding all other boundaries as non-applicable.

Community solid waste planning programs did not materialize with 1966. Many plans have been produced in recent years. The Detroit Metropolitan Area Regional Planning Commission's study and plan, as well as Orange County, California's "Master Plan of Refuse Disposal" and the Capital Region (of Connecticut) Planning Agency's "Refuse Study" and one in Kansas, "Refuse Disposal from the Wichita Metropolitan Area" are some of the better examples of planning program publications. However, paper plans just add to the solid waste problems if the plans do not delineate a practical method of implementation.

Does the plan merely indicate present conditions, with a memo as to what disposal method would be better? Or does the plan outline a problem solution in rather specific terms -- naming places, dates, and methods in detail?

All of us have seen plans for future progress, so vague that we have been unable to determine who, what, why, or when. There is also danger in being so specific that interruptions in plan implementation cause a fatal hyphen in the minutely detailed program.

Again we must look for the workable "in between," a plan of broad scope, practical in every way with sufficient detail to show the way, but not so detailed as to establish a rigid road with no rebound or recovery characteristics.

The solid waste plan should contain some elasticity -- at least enough to accommodate community growth and thence we come full circle -- to the need for a living, growing type plan -- continually reviewed and refined, but basically directed toward an improved program of solid waste handling.

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KEYS TO PROGRESS IN SOLID WASTE MANAGEMENT-RESEARCH AND ENGINEERING STUDIES*

Raymond C. Loehr**

INTRODUCTION

The current emphasis on solid waste management represents a resurgence of interest in a problem that has been with us since before Adam threw out the first apple core. The increasing concentrations of people in communities of all sizes have caused a greater awareness of and need for more adequate solid waste collection and disposal. The progress that has been made can be assessed by the following statement made over sixty years ago. "In no branch of municipal service has so little progress been made in the United States as in the disposal of garbage. Why do such conditions exist? First because the sanitary collection and disposal is appreciated neither by the general public nor the city official; second, because it is seldom recognized that problems incident to final disposal are largely engineering in character and therefore should be entrusted to engineers" (1).

The above statement is as valid today as it was then although the term refuse should be substituted for garbage. It is to the latter point in the above statement that I would like to direct this discussion.

Competent engineering services are needed to delineate the most preferable refuse collection system and disposal methods as well as the cost that will be involved. The value and economy of a comprehensive study and report cannot be overemphasized since it will provide the information and data necessary to make a judicious decision for community action and will outline procedures to implement it.

Although the most pressing problems are apparent in the larger communities, less densely populated areas are not immune to the problems associated with the satisfactory collection and disposal of solid wastes. The smaller communities have equally difficult problems since what is adequate and economic for a large city may not be for a small community. Capital investment as well as operating and maintenance costs increase per capita as the community size decreases. This is especially true for operations where only low value products, such as refuse, are processed.

DISPOSAL SYSTEMS

Engineering activities are intimately connected with the evaluation and design of adequate and nuisance free disposal facilities

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*Portions of this paper were presented to the Symposium on Solid Waste Management, University of Kansas, March 2, 1966.

**Professor of Civil Engineering, University of Kansas, Lawrence for a community. There are basically three methods of refuse disposal that merit serious consideration: sanitary landfill, composting, and incineration. The selection of the best method of refuse disposal for a community involves careful consideration of many factors. A comprehensive engineering study will be able to determine: 1) whether local conditions make one method particularly suitable, 2) the effect and results of interruptions of disposal procedures either by weather or mechanical failure on the community, 3) the cost of the various methods, 4) whether methods can be adapted economically to changing conditions in the city, and 5) what elements in each method are likely to gain public support or meet with antagonism.

A sanitary landfill operation uses the processes of controlled compaction and cover for refuse disposal. When adequate land is available, landfill is probably the most economical disposal method since it requires relatively small capital investment and may reclaim land that otherwise would be useless. Composting involves a rapid decomposition of the biodegradable solid wastes by the use of aerobic microorganisms under controlled conditions. The result is a nuisance free humus-like material useful as a soil conditioner. While theoretically the method has several significant advantages such as small plant site and a valuable end product, the present market for the end product is uncertain and storage can be a problem. Incineration reduces the volume of refuse by combustion with the ultimate disposal of the incineration residue and non-incinerated matter at a sanitary landfill. Advantages of this method include small plant site, central location, and reduced haul lengths. However the capital and operating costs of the method are relatively high and severe air pollution problems can result if inefficient incineration occurs.

The various disposal methods are at best only a partial solution to the municipal refuse disposal problem. At this time the two proven methods which satisfy present day requirements are sanitary landfill or incineration combined with sanitary landfill of the residue and noncombustibles. The choice between these methods is an economic one determined by analysis of the total cost of refuse disposal including the effect of the refuse disposal method on collection costs. These determinations and related analyses are best accomplished by a comprehensive engineering study which should include alternative methods of disposal, collection costs, and pertinent community conditions. Many states have regulations applying specifically to refuse disposal, have established minimum design criteria, and require approval of plans and specifications by an appropriate state agency. Other states have delegated such authority to local authorities. A recent survey showed that most state officials favor closer state control of all phases of refuse disposal with detailed regulations and power of enforcement (2). Selection of an engineer or consultant is the poorest place for local officials to attempt to economize. Every effort should be made to obtain the best services available.

Sanitary Landfill

Although sanitary landfill appears to be a simple engineering feat, there are a number of items that require close engineering scrutiny. These include stimation of needed land requirements, proximity to residence and industry, availability of adequate cover, accessibility, length and time of haul, surface drainage, future land use, water pollution, and public health and safety. Inadequate attention to the above factors has led to such problems as the need for costly importation of earth cover, inefficient use of landfill disposal capacity, and lack of sufficient drainage facilities (3).

Water pollution hazards and traffic problems can be controlled by good engineering. In general, landfills should not be located on sites where ground or surface water will intercept the deposited refuse. Access roads should be designed and constructed so that traffic will flow smoothly and will not be interrupted by inclement weather. It is also of importance to avoid delaying the collection vehicles at the disposal sites since this can increase collection costs.

Incineration

The complexity of incineration design and operation requires competent engineering services. Determination of capacity and location are the first steps to be taken in planning for incineration. Capacity depends on the service area, population, waste volumes and the design period for the incinerator. Principal location factors are length of haul, site, topography, available utilities, and public acceptance. Consideration must also be given to the prevention of air and water pollution, to subsoil exploration, to residue disposal, to adequacy of incinerator components such as storage bin size, furnace capacity and mechanical equipment as well as to adequate air for combustion and control of furnace temperatures. Because incinerators are generally located within the city, attention should be paid to the architecture and construction of the incinerator. A competent engineer will provide a plant that can operate well at capacity and that will be nuisance free, i.e., one that meets all locally imposed regulations and is acceptable as a good neighbor.

A major problem area in incineration operation and design is the stack effluent. Many cities have air pollution control ordinances. Most include provisions for the control of smoke, odors, and fly ash. A few also include provisions for control of gaseous discharges. Present day incinerators can be designed for high performance standards.

REFUSE COLLECTION

There is a close interrelationship between disposal techniques and collection methods. Decisions on both items should proceed simultaneously. The cost of collection represents one of the major costs of solid waste systems and hence it is in this area that significant economies may be possible. It has been estimated that 80 to 90 percent of the total cost of landfill operations and approximately 60 percent of incineration operations can be attributed to collection and transportation.

The collection and disposal of municipal refuse has not only economic but also health, nuisance, and pollutional ramifications. One of the most costly and least desirable refuse collection methods is to permit the refuse to be irresponsibly placed into non-uniform containers at random points on the property. A less costly and more sanitary method is to require that the refuse be put into regulation containers at special locations. A comprehensive engineering study will be able to evaluate the desirability of refuse collection and disposal at central sites, of refuse disposal at the point of origin, of light weight refuse containers, of disposable refuse containers, and of private versus municipal collection for a particular community. These and other factors such as frequency of collection, route of travel to the disposal site, and the disposal method itself are all interrelated and decisions affecting any one item may have repercussions on the other factors.

For example, the location of the refuse container will have a direct effect on the cost of refuse collection. For economy of collection it is most desirable to have the refuse containers as close to the street or alley as possible. Community aesthetics and attitudes frequently determine that the container location be at the rear of the house. It has been estimated that rear of house collection can cost as much as 25-50% more than curbside collections (4). Citizens in some communities may prefer to transport the refuse containers to the point of collection, i.e. curb or alley, to avoid paying a greater service charge.

The increasing numbers of home garbage grinders are another example of the relationship between collection and disposal. These grinders have materially reduced the quantity of garbage that must be collected although community wide installations of garbage grinders can be expected to reduce the volume of refuse collected by less than 10%. The savings in collection costs will be very slight unless the removal of putrescible garbage enables a community to discontinue separate collection of garbage or to reduce the frequency of combined refuse collection. Garbage grinders will increase the quantity of solids in the sewerage system. In sewers with flat grades and in wastewater treatment plants not designed to handle this extra solids load, severe problems have arose. If the majority of garbage in a community were ground and discharged to the sewerage system, the BOD of the raw sewage could be about 30-40% higher and the suspended solids concentration could be about 50% higher than without the garbage. If a sewage treatment facility was near capacity before grinders were installed, plant capacity may be exceeded after grinders are installed and additional capacity may have to be provided. In spite of such problems central refuse grinding is being seriously considered as a potential solution to the refuse collection and disposal problem. The Los Angeles County Sanitation Districts have experimented with such an approach for ground combustible refuse and have been encouraged by the results. The implications of these systems are extremely interesting as they would drastically reduce the manpower and cost of collection by using the sewer as a conveyor for the ground refuse. Non-combustible rubbish and large awkward objects would require removal by more conventional means; however, frequency of collection would be markedly reduced.

On-site refuse incinerators also offer significant potential as a method for reduction of refuse collection and disposal costs. Both outdoor and indoor incinerators are possible; however indoor incinerators are not the panacea for refuse disposal since they can cost a family at least as much or more as municipal refuse collection and disposal. In addition, if maintenance and replacement are minimum, odors and air pollution may result.

A recent innovation that may have considerable impact on collection systems is the use of disposable paper bags as the refuse container. The filled bags are more easily handled by collection crews and have been found to be more sanitary from the standpoint of insect control and odors. It has been reported that with the bags a much greater volume could be compacted in the collection trucks causing fewer trips to the disposal site.

The use of the bags eliminates the need for the collection crew to return the refuse containers to the original location, permitting a reduction or better utilization of the staff. The method generally costs the householder the same or slightly more than traditional refuse collection and disposal.

Engineering studies can delineate the possible types of equipment, personnel, routes, containers, frequency of collection, and type of disposal facility that will yield the optimum procedures at minimum cost in a particular community. In addition engineering studies can evaluate the impact of various types of refuse collection and disposal procedures on the total municipality as they relate to wastewater collection and treatment methods, to the air pollution potential, and to community public relations. Further innovations include systems analysis and optimization techniques which offer intriguing possibilities of investigating changes in and planning for refuse collection systems without extensive field trials (5).

These and other innovations in engineering design and evaluation can be extremely useful in planning refuse collection systems. Most municipalities do not have the staff to do this work although some communities have achieved increased efficiency and cost reduction by using their own personnel to revamp their collection systems (6, 7).

NEW APPROACHES

Research

Any discussion of keys to progress of a problem inevitably deals with both engineering and research. New ideas must be evaluated in laboratory, pilot plant, and full scale investigations (research) and also must prove feasible from the technical, operational, and economic standpoint (engineering). There are infinite possibilities for engineering research in the area of solid wastes management. Some of these possibilities have been touched upon previously, i.e., systems analysis for planning and changing collection and disposal systems, alternative methods of collection such as a water carriage system for ground refuse via the sewers, different types of collection containers such as plastic or paper containers or bags, and better methods of private disposal to reduce the quantity of refuse disposed of by a municipality. Other possibilities such as combined disposal of refuse and sewage sludge, high pressure compression and baling, suitable treatment and reuse of solid wastes components, and alteration of techniques in the packaging industry are equally intriguing.

Additional research activities such as a better understanding of the quantities and characteristics of refuse, of the efficiency of current and proposed disposal methods, and of the effect of the refuse and the disposal residue on the environment also may be fruitful. The mass of refuse that continues to accumulate and the needs for research in solid waste management are so vast as to defy any meaningful listing of possible research activities.

If history repeats itself, as it generally does, the burden of research and investigation will fall upon research organizations and those who must use the processes. Analogies might be drawn between the solid waste disposal problem of today and the wastewater treatment and disposal problems of a few decades ago. Within this time period, research personnel in universities, governmental laboratories, private organizations, and treatment plants made significant contributions to our fund of basic and applied knowledge in the area of wastewater treatment. Treatment efficiencies increased, better processes were developed, more economical approaches were explored, and management techniques were applied to the problem. It was recognized that although problems existed in local communities, the solution of individual problems have ramifications beyond political boundaries and the solution to such problems must be attempted on a regional basis.

Similar activities will take place in the solid waste field. It may be too much to expect that the lag between the time that the public realizes there is a solid waste problem and the time that adequate solutions are found will be shorter than it was with the problem of adequate wastewater treatment. However, the recent emphasis on solid waste disposal that initiated Symposia such as this, has provided an excellent start in terms of interest and financial assistance.

People

There remains, however, a serious bottleneck in the realization of a rapid and satisfactory solution to the problem - people. People are what will cause the activities in this area to be less than optimum. There are not enough people available with adequate knowledge to staff the administrative, the research, and the operational positions that are currently needed and available. Most of the people currently in the field had their training in water and/or wastewater treatment. The problems inherent in the quantities and characteristics of solid wastes, and in the handling and disposal of solid wastes are sufficiently different and complex that the optimum training of personnel for the solid waste field will not be the same as that for water and wastewater personnel.

It is also in this area that the educational institutions have a critical and tremendously challenging role. People must be trained not only to staff administrative positions in various governmental units, not only to become competent planning and design engineers, not only to conduct research in this area, but also to operate the plants and processes that are built. The time and effort of all who labor in this area is wasted if the plants and processes do not operate efficiently.

At this time it is extremely rare for an educational institution to have a course, let alone a program, to train people in the area of solid wastes disposal. Educational institutions must meet this challenge in order to eliminate this crucial bottleneck. However, local, state, and regional organizations face an equally large responsibility to provide proper in-service training to develop the present and expected solid waste personnel.

SUMMARY

The solution to the solid waste collection and disposal problem lies in many areas. Contributions will come from experts in law, management, planning, education, and engineering but the greatest contribution will come from engineers. The ingenuity of the engineer will be challenged to resist becoming so entrenched in traditional methods of thinking and design that he does not adapt to generate, investigate, and evaluate new ideas, approaches, and solutions for ever-increasing problems.

The fundamental cause of the solid waste problem is people. Accumulations of people who produce the wastes, increasingly affluent people who by their desire for convenience have created whole new industries and at the same time increased the quantities and types of solid wastes, the lack of enough qualified people to solve the problem, the general disinterest and apathy of people, and the relatively few people who can think creatively and imaginatively to provide new ideas and possibilities.

It is in these areas that the keys to progress lie. It is in these areas that the research must be done and it is to these areas that the engineering profession can contribute most significantly to the problem.

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ADEQUATE STATE LEGISLATION

E. A. Mosher *

EDITORS NOTE:

> **Mr. Mosher first reviewed the legal status of solid waste disposal in Kansas and then presented the following comments as to the adequacy of this legislation. A report entitled, "Legal Aspects of Solid Waste Collection and Disposal" begins on page 56.**

There is evidence to indicate that unless Kansas cities do a better job than they have done in the past, we can expect some state regulation and control. There are at least two developments which result in this expectation.

First of all, there is an increasing public concern with beautification and the physical attractiveness of our environment. This concern to date is largely negative, in the sense of removing that which is considered unsightly--that which offends our aesthetic tastes--rather than a positive force for creating that which is attractive. In any event, certainly the current, common practices for disposing of solid wastes is fair game for the increasing number of individuals who seek the elimination of that which is offensive to the eye.

A second development is the growing national interest in pollution control, not only in preventing the pollution of our lakes and streams but also the air we breathe.

These developments, together with the growing urbanization of our society and the traditional concern with public health, has already brought state control of disposal practices in other states. One notable example is a 1965 law of Illinois, designed to eliminate open and unsanitary dumping within the state. The Illinois state department of health is now developing minimum standards under state law governing the location, construction, operation and maintenance of refuse disposal sites and facilities. The traditional open dumps will be prohibited.

Existing Kansas laws are probably not sufficient at present to authorize the state board of health to adopt stringent regulations. Possibly it could be done through administrative regulations, but it appears unlikely that the state board will do this without clear state legislative authority or mandate. The prospects of such regulatory legislation and administrative regulations is increasing each year, and will probably come about unless we do a much better job than we have in the past. Indeed, they will probably come about anyway, since there will be a few cities and private operations which will always be unsatisfactory under a completely voluntary program.

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Existing state legislation relating to solid waste disposal by cities appears reasonably adequate. The principal problem for cities appears to be the acquisition of sites. In addition, the existing authority for joint city operation appears reasonably adequate.

Perhaps the principal, long term need in Kansas is for legislation to authorize an area approach.

One widely used solution to obtaining an area approach to governmental problems is to provide for special districts. I think this approach deserves consideration in Kansas but only if the district is created by and representative of the cities, and possibly also the townships, which are included. I personally object very strongly to independent districts which are not responsible to any elected governing body.

In Kansas, there does not appear to me to be any need for such special districts, possibly excepting the Wyandotte-Johnson county-Kansas City metropolitan area. Instead, I think a better solution would be a county or bi-county approach, which could assist not only small urban areas but also our larger urbanized areas and metropolitan areas.

The fact is that most of our 623 incorporated cities, 439 of which have less than 1,000 population, simply can't afford to operate an adequate disposal program. Even if by some strange circumstance they have the money to do it, it is often inefficient to do so. A logical alternative is to utilize the county highway equipment to provide and maintain landfill disposal sites at suitable locations throughout the county. These sites could be used not only by cities and their residents but also the residents of unincorporated areas.

At the same time, it is feasible in some larger counties for the county to provide disposal sites for the larger urban areas.

The Kansas County-City Cooperation Committee recommended such a bill at the 1965 legislative session--SB77. It never got out of committee, for reasons which need not be mentioned here. This proposed legislation authorized all counties to acquire disposal sites by lease, condemnation or purchase. It authorized the county to construct buildings, incinerators or other structures and to use existing equipment or acquire other equipment. As an alternative, the county would also be empowered to contract with any city or cities for the use of such disposal sites.

To finance the operation, the county could use money from its general fund and also levy fees and charges. General obligation bonds could be issued subject to a petition of referendum. Rules and regulations could be adopted as to the use of the facility.

There is one obvious shortcoming to this proposed legislation, and that is the financial equity of the tax levies necessary for the retirement of bonds or the general operating fund. On the one hand, it is reasonable to expect that farmers would object to paying taxes on farm land for refuse disposal purposes. On the other hand, residents of incorporated cities might reasonably object to paying a county tax if they live within a city which is operating its own disposal system.

There are various alternatives to handling this finance equity dilemma. It is reasonable to expect that the charges for use of the disposal site would be sufficiently high to cover the operation phases. The problem occurrs in financing the capital investment, including the site, facilities and equipment.

It has been suggested that revenue bonds be used, but I rather doubt that these would be saleable at a reasonable price. Tax supported bonds would probably be necessary. It would be possible to use revenue bonds but pledge property taxes to secure them. If tax levies become necessary, a requirement could be written into the law requiring a later transfer of an equivalent amount of disposal collection charges to the general operating fund.

Another alternative is to provide for the creation of a tax service district similar to some of our fire districts. In this case, only property within governmental units benefiting from the disposal operation would help support it.

Finally, it does not appear unreasonable to permit the county to at least spend a small amount from its general operating fund, or levy a small county wide tax, to finance minimum disposal programs such as might occur in a county with a comparatively small population. This type of arrangement would appear advisable when the primary intent is simply to use county highway equipment and forces to provide minimum disposal sites at suitable locations throughout the county.

Legal Aspects of Solid Waste Collection and Disposal

As to cities--Questions 1 to 15.
Joint city operations--Question 16.
As to counties--Questions 17 to 19
As to townships--Question 20.
Miscellaneous state laws--Question 21.
State board of health regulations--Question 22.
Federal laws--Question 23.

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1. May a city establish a refuse collection and disposal system?

Yes. The collection and disposal of garbage and trash have long been considered as a proper municipal function and Kansas cities could therefore exercise their constitutional home rule authority in this area. However, K. S. A. 1965 Supp. 12-2102 contains specific statutory authority. This statute provides that any city may provide for the collection and disposal of garbage or trash. This may be done directly by the city, by contract with a private party or by a combination of methods, such as contracting for collection and municipal operation of the disposal facility.

2. Is a referendum required?

No. However, K. S. A. 12-2109 requires publication of notice of intent and permits ten percent of those voting at the last city election to compel a referendum as to whether the city shall establish a system by contract or as a municipal function.

3. May a city acquire the necessary land and equipment?

Yes. Under K. S. A. 12-2102 there is general authority to purchase equipment, acquire land, construct buildings and facilities and to lease or otherwise acquire use of land for disposal operations.

4. May a city acquire land outside of the city for disposal sites?

Yes. Under K. S. A. 12-2123, cities of the first and second class may acquire land within or without the city, by gift, purchase or condemnation. If condemned, the city receives fee title. There is similar statutory authority for cities of the third class in K. S. A. 15-1132.

5. **May bonds be issued?**

Yes. See K. S. A. 12-2104 under which an election is required. Cities of the first and second classes may issue bonds under K. S. A. 12-2123 without an election.

6. **How may the collection and disposal operation be financed?**

By the general fund, the levy of a special tax or by service charges, or by a combination of two or all three of these methods, under K. S. A. 12-2104. Under home rule, the tax levy limit authority of the general operating fund could be increased to avoid the necessity of a separate levy fund.

7. **May a city legally discontinue water service if the consumer fails to pay a refuse collection charge?**

Nearly all Kansas cities with a municipal refuse system collect their charges in connection with their water or sewerage service charges. Although the question as to whether the city may discontinue water service for failure to pay a proper refuse collection service has never been determined by the courts of this state, it is generally accepted that a city may not legally discontinue water service for payment failure as to a refuse charge. The two services and two charges are generally considered to be separate.

8. **What action may a city take against someone who refuses to pay a refuse collection charge?**

A city may discontinue future service. It may institute legal proceedings for the collection of the amount due for such service. It may charge and prosecute such a person for violating a provision of the city ordinances.

9. **May a service charge be used to finance disposal operations as well as collections?**

Yes, and this is the general practice. The city may collect a charge for both purposes even when the collection service is provided by a municipal contractor and the disposal operation by the city. In such instance, a portion of the total charge is paid to the contractor and the remainder retained by the city.

10. **May a city providing a municipal collection and disposal service prohibit individuals from hauling or disposing of their own refuse or arrange it with a private contractor?**

No. However, under K. S. A. 12-2106, the city may by ordinance regulate the accumulation of garbage and trash on private property and may also prohibit the owners of garbage and trash from transporting it on the public streets or disposing of it in a manner causing a nuisance or in unsightly or unsanitary ways. The city may provide for the licensing and regulation of private haulers, and impose standards as to equipment and methods. In other words, the city may "discourage" private persons from hauling their own refuse or using a private carrier but may not flatly prohibit it.

11. May a city regulate the burning of trash within its corporate limits?

Yes. "Municipal corporations may regulate and in proper cases prohibit garbage incineration and trash or waste fires." McQuillin's Municipal Corporations, 3rd Edition, Volume 7, Section 24.470, page 437. Under their home rule constitutional powers, cities may enact reasonable regulations and may probably flatly prohibit the burning of trash or waste except in incinerators which cause no public health or other nuisance.

12. May a city restrict the use of the municipal disposal facility?

Yes. The operation of a disposal facility is discretionary with the city. The city is not required to provide a means for disposal of solid waste and therefore may exercise such control as it deems necessary. This could include levying of a fee for private use of the facility, restrictions as to hours of use, type of wastes, or simply a flat prohibition against its use by private persons and haulers.

13. May a city prohibit the operation of private disposal sites within the city?

Within reasonable limits, yes. A zoning ordinance may be used to restrict its location. The new so-called city beautification ordinances may be used to prohibit the accumulation of waste materials which are unsightly as well as those constituting a public nuisance. Under home rule, cities may adopt reasonable regulations over private disposal sites within the city.

14. May a city regulate or prohibit private disposal sites outside the city limits?

The city alone probably has no such authority. The county could restrict the location of a site outside the city by zoning regulations. City residents might be able to enjoin the operation of a disposal site constituting a public nuisance.

15. May a city be held liable for the negligent operation of a disposal site?

In Kansas it has been indicated but not specifically decided by the supreme court that the collection and disposal of garbage and trash is a governmental function and therefore, probably a city is not liable for injuries or damages inflicted through the negligent operation of its employees while engaged in such function. However, a city might be held liable for damages resulting from a nuisance caused by the negligent operation of a disposal site.

16. May two or more cities jointly provide for the collection and disposal of refuse?

Yes. K. S. A. 12-2112 through K. S. A. 12-2122 specifically provide for such an arrangement involving two or more cities. They may jointly acquire the site, acquire the equipment, issue bonds and levy taxes and service charges for this purpose.

17. May counties regulate refuse outside of cities?

Yes. Article 37 of Chapter 19 of the statutes specifically authorizes any county with a health department to adopt a sanitary code. These regulations may cover "refuse storage, collection and disposal." Under K. S. A. 19-3701, the health department of such a county must employ one or more full time sanitation personnel before it may adopt and enforce a sanitary code.

18. May a county establish a solid waste collection system?

Except as to Sedgwick county, there is no statutory authority for counties to perform such a function, and under the general rules of law relating to counties, it is generally agreed that this is at present a function not within the authority of the county. K. S. A. 1965 Supp. 65-204 authorizes Sedgwick county to levy up to 2/10 mill to finance garbage and trash disposal either as a joint operation with any city therein or as a sole operation of the county.

19. May a county provide for a refuse disposal site?

With the exception of Sedgwick county, (see foregoing paragraph) there is no statute specifically authorizing county governments to provide for refuse disposal sites. There are examples where this is done on a minor scale, such as the county highway department establishing small dump site areas in suitable spots throughout the county. However, there is no clear authority for a county to perform this as a regular function or activity or to levy taxes therefor.

20. May a township provide refuse disposal service?

Townships having a population of 7,500 in Johnson county may provide for refuse collection and disposal, and two or more such townships may join for this purpose under K. S. A. 80-2201:2:3. Townships in counties having a population between 55,000 and 100,000 (Reno) may provide for the disposal of garbage, rubbish and trash under K. S. A. 80-2204.

21. What other statutes relate to garbage or trash?

K. S. A. Chapter 47, Article 13, relates to the feeding of garbage to animals. All garbage fed to animals, except that obtained from his own household and fed to his own animals by an individual, must be heated to a temperature of 212 degrees Fahrenheit for at least 30 minutes. A city may not contract for the collection and disposal of garbage unless the contract requires the specified processing.

It is unlawful to throw, place, deposit or leave, or cause to be thrown, placed, deposited or left in or on any public highway any dirt, filth, sewage, sweepings, dump ashes, tin cans, bottles, glass or other refuse of any kind. K. S. A. 21-578:9.

It is unlawful to litter any lake, stream, watercourse or other body of water with trash, rubbish and debris except at the direction of the township trustee, or board of county commissioners or the owner of the premises. K. S. A. 21-592.

It is unlawful to dump trash, debris or sewage on any highway or any ditch at the side of the highway. K. S. A. 68-545.

22. What authority does the state board of health have over public refuse collection and disposal?

The state board of health has general supervision over the health of citizens (K. S. A. 65-101), and may order the removal of nuisances and "sources of filth" which may be injurious to health. (K. S. A. 65-159)

23. What federal laws apply?

The new highway beautification act (Pl 89-285) includes "garbage dumps and sanitary fills" in the term "junk yards". Federal aid for the interstate and primary highways is reduced by 10 percent beginning in 1968 for those states which do not have effective control over junk yards within 1,000 feet of such highways. Areas zoned or used for industrial purposes are exempt from this requirement.

DISCUSSION

Q. Dr. McKinney * -

Mr. Shull mentioned standards this morning. What kind of standards do you have in mind?

A. Mr. Shull -

I don't suppose we have to have any real misgiving about this. These standards ought to be such that disposal of solid wastes would not be detrimental to our health; would not be detrimental to our resources; (I'm talking about water, air, and land) and would not be detrimental to the normal use of adjacent property activities. Basically this means that we won't pollute water, we won't pollute the land by littering up the landscape, and we won't pollute the air. These are the areas of major public concern. I would much prefer that any standards established be the product of deliberation and discussion by groups such as we have here today. Certainly, as Ray and some of the other speakers have indicated, the cost of solid waste disposal has got to be reasonable. So our goals must be practical goals that the public can afford and will support.

Dr. McKinney -

Thank you Ivan. I will be perfectly frank with you, I like your minimum standards and I hope that the regulatory agencies will remember them also when the time comes. Do we have any other questions or comments?

Q. Is there such a thing as a "sanitary land fill"? If so, don't we need some kind of guide for locating, and operating them?

A. I think the answer to that is a very definite yes. No question about this. I think that even the state health department will help in this area, won't they, or will they? Well, are they trying to resolve some of the problems shown in the pictures of the Topeka operation. In other words, is this the kind of land fill that is a sanitary land fill. Now the land fill operations we see in most of the Kansas towns definitely aren't. Lawrence is an excellent example of a lousy sanitary land fill. If you want to see a lousy one go down and take a look at ours. A sanitary land fill does not allow burning. A sanitary land fill does not allow the material to blow around on the property. The real difficulty is getting a clear understanding of what constitutes a properly

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*Dr. Ross E. McKinney, Chairman Department of Civil Engineering University of Kansas designed sanitary land fill. Part of the answer is more education and information related to sanitary land fills. I know down in Texas a number of years ago the state health department conducted a demonstration program. They went around to cities and gathered people together in regions to demonstrate the proper way to operate a sanitary land fill. I came out here from a community in Massachusetts where they ran a sanitary land fill where everybody hauled in their refuse personally, which is one of the hardest ways to operate a sanitary land fill. It can be done. The easiest way is where you have a municipality bringing all the material to the fill under tight control. If they can run one up there in Massachusetts with all their ins and outs of politics and everything else, we certainly can do it in Kansas, but we don't and I think we've got some real problems ahead of us.

Q. Is any area used for disposal of car bodies, ice boxes, etc., a sanitary land fill?

A. McKinney -

I think it is a junk yard in the sense that all these waste materials are junk which we don't have any use for. We hope that they will not look like our junk yards. Another question back there?

Q. Theoretically a sanitary land fill is a very nice and neat place, but there are far too many examples of where they are not properly operated. Why?

A. McKinney-

I think it's not that it costs too much money. Too often our answer as to why we don't do things is lack of money. A more honest reason is that we don't have people who are concerned enough about running it properly. Money along will not create, shall we say, the incentive. There must be more than money! I think that Mayor Wright has demonstrated that if he has someone who has an ax to grind, or shall we say has got a reason to go this direction, you can make him work. Now money will help, but you can have all the money in the world but if you haven't got the guy who will show concern, the money won't help. We can put a PhD out there and he'll still run it wrong and you can pay him all that kind of money that it takes to get him out there and it won't help you.

Q. Is the most important thing in a successful sanitary land fill that the bulldozer operator knows what he's doing?

A. McKinney -

I think, Mayor Wright, this is the key. Up there in Massachusetts where we were, the bulldozer operator knew how to run it. The helper who controlled the traffic in and out of the sanitary land fill was also a very important person. He wanted the job done right too.

Q. I've heard the term "adequate collection" used several times and I know there are quite a few public health people here. I would like to know what is considered adequate collection in terms of frequency. How would the state health department define it?

A. Ivan Shull

I would say the normal frequency of collection in most Kansas communities today is twice a week in residential areas and daily in commercial areas. There are a few communities who are attempting to get an appreciable number of garbage grinders in their residential areas and reduce the frequency to once a week. The most expensive situation you can have in a community is one where half of the homes are equipped with garbage grinders and the other half are without them. Cities are going to have to decide which way they wish to go with their residential garbage.

Q. Mr. Mosher

In view of the difficulties that Mr. Wright reported this morning, should we begin to think about zoning for these disposal sites?

A. McKinney

I'm not sure I know what you mean, but this is why I'm intrigued with the possibility of counties becoming more involved.

Mr. Mosher

Shawnee County Board has zoning regulations. Charlies solved this problem of the three mile area. If the Board of County Commissioners had the problem of making the decision the way its going to be done, they might have a little bit different view of it. This is part of the reason why the recent legislation became embroiled in the Wichita-Sedgwick County squabble as to where the land fill was going to be located. Some of the city folks wanted to make it clear that this was not to be under control of the zoning regulations the county had. For example, livestock feedlots were exempt. This would have exempted any public disposal operation from the scope of the zoning regulations. It got so bad in Wisconsin in about 1954 or 1955 that the legislature finally passed a law giving townships the authority to prohibit cities from driving waste vehicles on township road.

Mr. Clemmons -

I was just going to mention in Iowa a law passed allowing townships to establish refuse disposal sites but it didn't do anything.

I would like to comment on Mr. Shull's earlier comment relative to air pollution. We need to be very careful about making a statement that a disposal site or method must not "pollute the air". This is a relative term. Many cities, not in this particular vicinity, are forced to go to incineration and no matter how good a job you do cleaning up these sites you do pollute the air. This has to be taken into consideration on an overall area basis and this is one place where we need a lot of research - in the air pollution inventories in large communities.

McKinney -

I think part of our problem probably deals in sematics of what are we talking about when we say "pollution" and I think this is where we get ourselves in difficulty. It is too bad we can't have some of the people in the colleges straighten out the English language a little bit for us so that when we say something we all understand what the other fellow means. As it turns out, when you mention pollution here, you are talking in terms of putting any kind of contamination into the atmosphere and I think Ivan might be talking in terms of putting anything damaging into the atmosphere. This puts it into a connotation of "is this damaging or is it not". Let's face it, when you breathe you are polluting the atmosphere. Now, do we want to stop you from breathing? I don't think we do. I think what we have to do is watch the word "pollution" because people are misusing it or should we say using it to their own purposes and using it with different definitions and so let's really try to, as much as possible, be reasonably precise in any statements we make so that everybody does understand exactly what we mean.

Q. In connection with urban renewal in most cities, there is a tremendous amount of noncompressible and noncombustable material being generated. I am wondering, do the cities leave it up to the people who tear down the structures to find ways and means of disposal of the waste material? What's being done in this area to help out the poor guy who has to get rid of the large quantities of wastes and large amounts of building material.

A. I think one of the things that is being done is, shall we say, is to recognize that he's got a problem and give him sympathy. This, I think is an important thing because if you've got a problem it's always nice to know that there is somebody in Washington or in the city or least somewhere that is sympathetic to you in your problem. Let's face it, the people who are concerned with solid wastes are very much concerned with the solution to this problem. There is no real positive solution that one can say "OK", this is what you do with it. If you are reading some of the engineering magazines, you have doubtless noted that it is being handled in different ways in different areas. Some of the cities which are fortunate enough to be located where there is a need for this kind of material, fine and dandy. Not everybody is getting rid of it, they're covering land the same as you would with sanitary land fill. This is one of the areas where we need research and I think this is an area in which we will see more research in the future.

SUMMARY *

Now that we've heard all this today, now that we've gotten all this information, what are we going to do with it? What's going to happen? Do we solve some problems this way or have we just had a very enjoyable day listening to people talk about the problems. We all agree that we have a problem. It is a big problem and it is getting bigger and bigger every day. Also, it is going to get more complicated. Basically, the people here in this room are those people who show the greatest concern for this problem otherwise they wouldn't have taken the time to come here. You are looking for some answers. Some of you found some answers. Some of you didn't get the answers you were looking for. I think we've got to recognize this as if there were and there are, basically, as of today, no real solutions to these problems. All we can say to you is, yes, we sympathize with you, yes, there are approaches that one can take; but basically, our problem is that we don't have enough information, we don't have enough organization, we aren't geared yet to really produce the results. We're just getting started. And so therefore, what's going to happen will depend upon you and you alone. Not what the Federal government does necessarily, not what the university does, although all of these may impinge upon your problem and may produce certain information somewhere along the line and certain ideas that will allow you to help solve your problem. But you alone are going to have to sit down in your area, whether it happens to be at a city level or happens to be at a county level or state level or federal level, and try to figure out where you fit into this overall picture and what you need in the way of information and where you can go to find it.

And you have to put it together to find your own answers. You can go to a consultant and say, now this is what I have gathered together, what do I do next? And you will find that he will bounce things back and forth at you until he arrives at some sort of a solution. This may solve your problem and it may not, but this is one way of doing it. You may come up to the university and talk to some of the people here. And you may find that, once again, they will bounce things back and forth; but the real key comes is that you've got to solve your own problems. You've got to figure out for your situation what the real solution is. And you will find out that yours may not be the same as the other fellows, it may be different. You can learn by looking at the other fellow's solutions, but it may not be the full answer. Now let's fact it, in a few minutes we'll all get up and go out that door and head for home. You can forget about what we've said here today and let life keep in rolling, because it will; or you can go home and you can roll up your sleeves and decide that you're going to go to work and do something in this particular area. Now let's face it, where do you start?

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*Dr. Ross E. McKinney

I have gleaned from our speakers during the say some ideas which I want to toss out to you. This is what I consider the basic approach to solving the solid waste problem and you may find that you want to add some more things to it. You may not necessarily agree with me, but I've tried to put it down into a basic form in the hopes that it will give you something to take home with you and think about. Now the first thing that we have to do to solve this problem is to recognize the problem. You've got to see it before you can solve it. The second thing, you have to find people who can do the work and people who have ideas which can be applied to this particular area. The third thing that you have to do is to find the money which can help pay for the solution because, let's face it, you don't get anything for nothing in this world. It will cost something. And the fourth thing that we'll have to do is to organize the people and the money together in the most efficient fashion so that we can solve the problem. Let's face it, there will never be enough money or be enough people to do the job the easy way. Therefore, the key to the start of any program lies in how you take "not enough money" and "not enough people," and put them together to solve the problem. Because frankly gentlemen, the problem has to be solved. It's not a question of will we solve it or won't we, it has to be solved if we're going to stay around on this earth. Where do we stand right now?

Take a look at these 4 basic approaches to solid wastes. Do we recognize the problem? It is my opinion the answer is no. We really don't recognize the entire problem. It's a big problem. It has many facets. The problem of solid waste to some of you is different than it is for others. It covers garbage; it covers refuse; it covers building wastes; it covers old automobiles; it covers old refrigerators; it covers anything that man discards that's solid. And that's what we're really talking about when we say solid waste. And we'd better recognize too, the thing that was mentioned by the previous speakers that when we talk about the solid waste problem we can't separate it from air pollution, and we can't separate it from liquid pollution. We are talking about one facet of the environmental pollution problem and only one facet. If we're going to really come up with the best solutions, we must think of all of these together as a unit and not just as separate pieces. We recognize solid wastes is a piece; but it is a piece of a big puzzle. And we've got to look at the whole system and not just the parts. You put solid wastes in the incinerator and you burn it up; and you say, well, there goes my solid waste problem. Alright, you may have created an air pollution problem; but you say, well that's the other guys problem. Like heck it is, it's yours too. Or you put it into a landfill and water comes along and picks up pollution as it seeps into the ground. And you say, well, that's not my problem because it's all wet. Well don't forget, where'd it come from? It's your problem. It's the people's problem and you have to concern yourself with it. And so therefore, don't lower your sights. You can't go wrong if you look at the problem in its broadest sense and then start narrowing it down into your little bitty aspect. But, be sure that when you narrow it down you haven't narrowed it down too small.

One of the things that we recognize is that there are not enough trained people in this field. Cities come around and ask where to find someone to run the bulldozers properly. You have to educate them. (3rd Belt) Where do you find the engineers that know how to design incinerators properly. You have to educate them. Where are you going to find the public works managers to get the job done? They're not around. Well then, you have to educate them. Let's face it, everybody pretty much up to now has not had what you call "formal education." They have learned by experience and there are many people who have learned very well by experience. Experience is a very good teacher. Our only problem is we recognize that experience is an inefficient way of learning. There are easier ways of learning and we hope we will apply some of these easier ways. But let's recognize it gentlemen, experience is going to be our teacher for the next decade because it's going to be that long before we can train very many people; before we can have a sufficient number to make any kind of an impact. And so until that time, you are the teacher, you are the people who are going to have to train the local people. You'll train your own employees, you'll learn the way that Mayor Wright learned, by getting in there and doing it. Now we can learn by watching the other fellow and if people like Mayor Wright make their experiences known to us, we can learn from the other fellow and we can capitalize on those mistakes that he has made and on those ideas that he has found that work.

Now with regard to money, let's face it gentlemen, all the money isn't going to come from Uncle Sam and remember one thing, Uncle Sam's money comes right from the people at home. I'm not one of the people who likes to send his money through Washington back to home because it always seems to lose something enroute. We talk in terms of getting state funds and saying well alright, let's let the state do it. We like the state rule. Well frankly, it's not the states problem and the state money is also your money. If you send it to Topeka, you'll find it loses something going to Topeka and coming back. The only time you really get the most for your money is when you recognize your problem yourself and you put your own money into it. Money is going to be a problem. If you wait for the federal funds before you get to work, look out, because you're going to have the solid waste problem building up much greater on you and it's going to cost you more in the long run. One of your biggest problems is going to be trying to convince the city managers and the city councils, that Uncle Sam hasn't got an open bag down there just waiting and will you hold off until we get our grants because this way it will cost us less. No it won't, it's going to cost you more.

Let's face it, right now there is no real organization to attack the solid waste problem. The American Public Works Association is gearing up. The American Society of Civil Engineers is trying to approach certain aspects of this problem. The American Society of Mechanical Engineers are trying to solve certain parts of it. These are professional organizations who are trying to recognize that there is a technical aspect that has been ignored and it was time that we got on with the job of trying to solve some of these problems. We're going to find out that the federal agencies have recognized that there is a problem here and the federal agencies are trying to organize to attack the problem. Remember this, the federal agencies can't solve all the solid waste problems in this country. They can only show you how to organize yourselves a little bit more effectively; maybe, by showing you an example or two someplace else. You can look at what they have done. You can look at what the states have done. Here in Kansas the state health department isn't organized to solve the solid waste problem. We've got to figure out how do we get organized. Suddenly we find out that we aren't ready. The problem has been around for a long time, but as professional people we ignored it. We've reached the stage of where the people whom we work for, won't let us ignore it anymore. So what are we going to do?

I want to throw out some challenges and I want to see how these bounce against you. I would like to challenge the University of Kansas to set up an educational program to educate young engineers with a background in solid waste, as well as in one whole aspect of pollution. We've made a start, yes. But we've got a long ways to go. I think the challenge is to continue to educate even better and faster. Not only should we educate at the university level, but we've also got to expand our program to educate at the lower level, a community wide type of level. It may well be that we will be able to expand our activities in this area in the future. I would like to challenge the municipalities to recognize that the solid waste problem is a real problem that exists in their area and not in the other guys area. And I would like for them to organize to meet this particular problem. I would like to challenge them not to wait for federal aid because it is a delusion and you'll only be trapped by it. I would like to challenge the state to recognize the problem that exists and to organize its agencies to develop sound programs to assist the cities, but not to do the job for the cities. I think this is going to require significant legislative action and I think we're all going to have to work together as a group in order to get this legislative action.

When you talk about solid wastes, everybody wants to put it in the other guys backyard. Solid wastes are created by people and they themselves have to handle their own problem. I think if everybody would handle his own problem satisfactorily, then we would not have to worry about who pays or dumping refuse in the other guy's backyard or anything else. We will find out that we can do a better job if we recognize our own problem and solve it within our own boundaries. This business of putting refuse outside the city limits isn't going to

solve it. Now I would like to challenge the U. S. Public Health Service to make certain that its solid waste program is a sound program. I would like for them to learn from past experience with other programs, because I think there are some lessons that they can learn and I'm not really convinced that they are concerned enough about those lessons. Too often the state programs and the federal programs are guided by politics alone. I would like to challenge the engineers and the technical societies to organize their activities to determine how we can have real solutions to these problems and not to just talk about these. One of our problems comes from the fact that we try to talk problems to death rather than trying to solve them. It's time that our professional technical engineering organizations started doing something rather than talking about doing something. Whether you like it or not, solid waste poses some real challenges to each and every one of us in this room. We can solve the problem if we want to solve it. This is the problem I think we really face. Now what I would like to do is to leave a challenge with each and every one of you to say to yourself that when you walk out of this room and head for home that you are going to do something about it. The only way problems can be solved is when people decide they're going to solve them and then set to work to solve them. You don't solve problems without work. And so gentlemen we've had a nice day and it's time to go to work.

Thank you.